

**U.S. Army Corps of Engineers
Omaha District**

**Final Site-Specific Work Plan
Fort Columbia Military Reservation
FUDS Property No. F10WA0314**

**Site Inspections at Multiple Sites, NWO Region
Formerly Used Defense Sites
Military Munitions Response Program**

**Contract No. W912DY-04-D-0010
Delivery Order No. 003**

July 2008



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FINAL

SITE-SPECIFIC WORK PLAN

Fort Columbia Military Reservation
FUDS Property No. F10WA0314

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Military Munitions Response Program

Submitted to:

U.S. Department of the Army
U.S. Army Corps of Engineers, Omaha District

Prepared by:

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List of Acronyms and Abbreviations

AOC	area of concern
ASR	Archives Search Report
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act of 1980
CFR	Code of Federal Regulations
CSM	Conceptual Site Model
DAHP	Washington Department of Archaeology and Historic Preservation
DERP	Defense Environmental Restoration Program
DMM	discarded military munitions
DoD	Department of Defense
DQO	Data Quality Objective
EPA	U.S. Environmental Protection Agency
FSP	Feasibility Study Plan
FUDS	Formerly Used Defense Site
GPS	global positioning system
HRS	Hazard Ranking System
INPR	Inventory Project Report
MC	munitions constituents
MD	munitions debris
MEC	munitions and explosives of concern
MMRP	Military Munitions Response Program
MRA	munitions response area
MRSP	Munitions Response Site Prioritization Protocol
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NDAI	No Department of Defense Action Indicated
NWO	U.S. Army Corps of Engineers, Omaha District Military Munitions Design Center
RI/FS	Remedial Investigation/Feasibility Study
SAP	Sampling and Analysis Plan
Shaw	Shaw Environmental, Inc.
SI	Site Inspection
SSHP	Site Safety and Health Plan
SSWP	Site-Specific Work Plan
TPP	Technical Project Planning
USACE	U.S. Army Corps of Engineers
USC	United States Code
UXO	unexploded ordnance
WDFW	Washington Department of Fish and Wildlife
WDNR	Washington Department of Natural Resources
WDOE	Washington State Department of Ecology
Work Plan	<i>Type I Work Plan, Site Inspections at Multiple Sites</i>

1.0 Introduction

This Site-Specific Work Plan (SSWP) presents the information necessary to conduct field activities associated with a Site Inspection (SI) planned at Fort Columbia Military Reservation (Fort Columbia). The SI field activities will consist of site reconnaissance for munitions and explosives of concern (MEC) and potential sampling and analysis of soil for munitions constituents (MC).

MEC are military munitions that may pose unique explosive safety risks, such as unexploded ordnance (UXO), discarded military munitions (DMM), or MC present in high enough concentrations to pose an explosive hazard. MC are any materials originating from UXO, DMM, or other military munitions, including explosive and nonexplosive materials, and emission, degradation, or breakdown elements of such ordnance or munitions (10 United States Code [USC] 2710(e)(3) and 10 USC 2710(e)(2)).

1.1 Project Authorization

The Department of Defense (DoD) has established the Military Munitions Response Program (MMRP) to address DoD sites suspected of containing MEC or MC. Under the MMRP, the U.S. Army Corps of Engineers (USACE) is conducting environmental response activities at Formerly Used Defense Sites (FUDS) for the Army, the DoD Executive Agent for the FUDS program.

Pursuant to USACE Engineer Regulation 200-3-1 (2004a) and the *Management Guidance for the Defense Environmental Restoration Program* (DERP) (DoD, 2001), the USACE is conducting FUDS response activities in accordance with the DERP statute (10 USC 2701 et seq.); the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) (42 USC 9601); Executive Orders 12580 and 13016; and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) (40 Code of Federal Regulation [CFR] Part 300). As such, the USACE is conducting remedial SIs, as set forth in the NCP, to evaluate hazardous substance releases or threatened releases from eligible FUDS.

While not all MEC/MC constitute CERCLA hazardous substances, pollutants, or contaminants, the DERP statute provides the DoD the authority to respond to releases of MEC and MC, and DoD policy states that such responses shall be conducted in accordance with CERCLA and the NCP.

Shaw Environmental, Inc. (Shaw) is responsible for conducting SIs at FUDS in the northwest region managed by the USACE Northwestern Division Omaha District (NWO) Military Munitions Design Center. Shaw has prepared this SSWP for the USACE, under USACE Contract No. W912DY-04-D-0010, as a supplement to the *Final Type I Work Plan* (Work Plan; Shaw, 2006).

1.2 Site Name and Location

Fort Columbia Military Reservation, FUDS property number F10WA0314, is located in southwestern Washington State at the mouth of the Columbia River, approximately 6 miles southeast of Ilwaco, Washington (Figure 1). The FUDS is located in Pacific County, and consists of approximately 769.7 acres in Sections 9, 15, 16, 21, and 22 of Township 9 North, Range 10 West.

The Fort Columbia FUDS is situated on land owned by the Washington Parks and Recreation Commission. The FUDS property boundary is shown on Figure 2. The *INPR Supplement* (USACE, 2004b) indicated that the area of the FUDS is approximately 769.7 acres, and the area of the single range (Battery Murphy) is 5,841 acres. Figure 3 shows the layout of the range on a 2006 aerial photograph of the FUDS.

The acreage for the Battery Murphy range is 5,841 and consists primarily of the range fan over the Columbia River (Figures 2 and 3). The Archives Search Report (ASR) (USACE, 2003) and *INPR Supplement* (USACE, 2004b) show slightly different footprints (Figure 3). The ASR shows the property as following the shoreline closer, including a 40 acre parcel acquired in 1941, and a range fan that points in a more southerly direction than does the *INPR Supplement*. The correct configuration of the range fan is unclear. A reference provided in the ASR (Appendix E-9) indicates a range fan arc (“field of fire”) of approximately 180 degrees, while the plates in the ASR and figures in the *INPR Supplement* indicate smaller arcs. The range fan depicted in the ASR is based on an interview with a former Fort Columbia gunner. For the purposes of this SI, the footprint of the land area and range fan is consistent with that shown in the *INPR Supplement* and as presented in the *Defense Environmental Programs Annual Report to Congress Fiscal Year 2007* (DoD, 2007). Figure 4 shows the current layout and range boundary of Fort Columbia.

1.3 Scope and Objectives

The primary objective of the MMRP SI is to determine whether a FUDS project warrants further response action under CERCLA or not. The SI collects the minimum amount of information necessary to make this determination, as well as (i) determines the potential need for a removal action; (ii) collects or develops additional data, as appropriate, for Hazard Ranking System (HRS) scoring by the U.S. Environmental Protection Agency (EPA); and (iii) collects data, as appropriate, to characterize the release for effective and rapid initiation of the Remedial Investigation and Feasibility Study (RI/FS). An additional objective of the MMRP SI is to collect the additional data necessary to complete the Munitions Response Site Prioritization Protocol (MRSP).

The scope of the SI reported herein is restricted to the evaluation of the presence of MEC or MC related to historical use of the FUDS prior to transfer. Potential releases of hazardous, toxic, or radioactive wastes are not addressed within the current scope. The intent of the SI is to confirm

the presence or absence of contamination from MEC and/or MC. The general approach for each SI is to conduct a records review and site reconnaissance in order to evaluate the presence or absence of MEC and to collect samples at locations where MC might be expected based on the conceptual site model (CSM) (Appendix A). The following decision rules are used to evaluate the results of the SI:

- Is No DoD Action Indicated (NDAI)? An NDAI recommendation may be made if:
 - There is no indication of MEC; and
 - MC contamination does not exceed screening levels determined from Technical Project Planning (TPP).
- Is an RI/FS warranted? An RI/FS may be recommended if:
 - There is evidence of MEC hazard. MEC hazard may be indicated by direct observation of MEC during the SI, by indirect evidence (e.g., a false crater potentially caused by impact of UXO), or by a report of MEC being found in the past without record that the area was subsequently cleared; or
 - MC contamination exceeds screening levels determined from TPP.
- Is a removal action warranted? A removal action may be needed if:
 - High MEC hazard is identified. Shaw will immediately report any MEC findings so that USACE can determine the hazard in accordance with the MRSP. An example of a high hazard would be finding sensitive MEC at the surface in a populated area with no barriers to restrict access; or
 - Elevated MC risk is identified. Identification of a complete exposure pathway (e.g., confirming MC concentrations above health-based risk standards in a water supply well) would trigger notification of affected stakeholders. Data would be presented at a second TPP meeting regarding the possible need for a removal action.

For purposes of applying these decision rules, the USACE has provided guidance that evidence of MEC will generally be a basis of recommending RI/FS. Evidence of MEC may include confirmed presence of MEC from historical sources or SI field work, or presence of munitions debris (MD).

1.4 Site Inspection Process

The steps involved in conducting an SI include:

- Reviewing existing data,
- Following the TPP process,
- Preparing the SSWP,
- Conducting the SI field activities (site reconnaissance, media sampling, and analysis), and
- Preparing the SI Report.

The TPP process is one through which project objectives and data collection processes are identified, and site stakeholders are brought together to discuss goals and objectives. This process includes the following phases:

- Identification of the current project area,
- Determination of data needs,
- Development of data collection options, and
- Finalization of the data collection program.

A multi-disciplinary team of key stakeholders attended a TPP meeting(s) in order to participate in the process so SI activities can be conducted in a timely and efficient manner.

1.5 Munitions Response Site Prioritization Protocol

The DoD is required to assign a relative priority for each munitions response site within a munitions response area (MRA). This process is to be completed for all DoD sites including FUDS, which are known or suspected of containing UXO, DMM, or MC.

Definitions:

Defense Sites – Locations that are or were owned by, leased to, or otherwise possessed or used by the DoD. The term does not include any operational range, operating storage, or manufacturing facility, or facility that is used for or was permitted for the treatment or disposal of military munitions (10 USC 2710(e)(1)).

Munitions Response Area – An MRA refers to any area on a Defense Site that is known or suspected to contain UXO, DMM, or MC. Examples are former ranges and munitions burial areas. An MRA can be comprised of one or more munitions response site (32 CFR 179.3).

Munitions Response Site – A discrete location within an MRA that is known to require a munitions response (e.g., remedial response) (32 CFR 179.3). MRSPP scoring is completed for each munitions response site.

1.6 TPP Summary

The TPP meeting for the Fort Columbia Military Reservation was held at the Fort Columbia State Park administration building on January 30, 2008. Representatives from the USACE – Omaha Design Center and Seattle District, Washington State Department of Ecology (WDOE), Washington State Parks and Recreation Commission, and Shaw were in attendance.

Shaw summarized the SI process, reviewed the site information, presented a summary of the site including potential MEC and MC, and the proposed approach for the SI addressing MEC and MC sampling. All parties were in agreement with the approach presented.

Specific discussions included:

Areas of Concern (AOCs): The State Parks representatives indicated that they have a drawing that clearly shows the artillery range fan for Fort Columbia. The State Parks has provided a copy

of the drawing showing the range fan for Battery Murphy. This is a copy of the same drawing from 1947 included in Appendix E-9 of the ASR (USACE, 2003).

The State Parks representatives indicated that there were likely two small arms ranges used at Fort Columbia. The first was located northwest of the batteries along the Columbia River shore near the present day Chinook County Park. However, the area that the first range occupied has been eroded away and sits approximately 200 yards out into the Columbia River. This is based on interpretation by the park historical resource representative. The second small arms range was reported to be located outside of the main gate near the Highway 101 tunnel under Fort Columbia. All that is known about it is that small arms fire was directed into the hillside. The State Parks representative indicated that a small trail off of the road may lead to the location. It was agreed that reconnaissance will be completed in the area to try to locate the small arms range.

The WDOE representative asked about the handling of the mines and whether the explosives were handled there or were the mines pre-assembled and shipped in. The State Parks representative indicated that there was no evidence that any assembly occurred and that the troop rosters did not identify any ordnance technicians as being stationed at Fort Columbia.

It was agreed that only the battery area (all three batteries) and potential small arms range were AOCs. Evaluation of the range fan area out in the Columbia River is not practical.

Stakeholders: Stakeholders include the Washington State Parks and Recreation Commission. The Chinook Indians may also be a stakeholder due to aboriginal land rights.

Accuracy of Historical Information: It was indicated that there were several inaccuracies in the historical summary contained in the meeting package. They were as follows:

- Only the Battery Ord third gun emplacement was decommissioned in 1910 due to water seepage problems. The remaining two guns were operational until 1918, when they were dismantled and removed.
- Battery Crenshaw was operational until 1921, when its guns were dismantled and removed.
- The original casemate building was constructed at the same time as the batteries, between 1898 and 1900. The new casemate building was built during World War I and then expanded and made gas proof in 1941 and 1944.

Screening Criteria: It was agreed that the EPA Region 9 Preliminary Remediation Goals are the correct screening values for human health, and ecological screening values consistent with those used for previous SIs (Fort Flagler Military Reservation and Fort Townsend) are appropriate for this FUDS.

Sampling: Two sampling approaches were discussed. The first was a no sampling approach; where it was discussed that due to the infrequency of gun firing (practice only), the age of last

use (greater than 60 years), and that all firing was completed over the Columbia River there was low likelihood that any explosive residue would be present. The second sampling approach was to collect two soil samples in front of each of the three batteries and analyze for explosives only. It was agreed that no sampling was necessary in front of the batteries due to the limited firing, time since last use (greater than 60 years), and that all firing was completed over the Columbia River.

It was agreed that if the small arms range is located, soil samples will be collected and analyzed for lead. No other sampling will be required.

1.7 Decision Rules

The following proposed data quality objectives (DQOs) and decision rules will guide Shaw's technical approach at various stages of the SI as the specific AOC is evaluated:

Objective 1: Determine if the site requires additional investigation or can be recommended for NDAI based on the presence or absence of MEC.

DQO #1 – Using trained UXO personnel and a handheld metal detector, a visual search of the Fort Columbia Military Reservation AOC will be conducted searching for physical evidence to indicate the presence of MEC (e.g., MEC on the surface, munitions debris indicative munitions use, and soil discoloration indicative of explosives). The visual search will consist of a meandering path survey along trails and in accessible areas. The following decision rules will apply:

- If no evidence of MEC is found, the AOC will be recommended for NDAI relative to MEC.
- If evidence of MEC is confirmed, the AOCs will be recommended for additional investigation.
- If there is an indication of an imminent MEC hazard, the site may be recommended for a Time Critical Removal Action.

Objective 2: Determine if the site requires additional investigation or can be recommended for NDAI based on the presence or absence of MC above screening values.

DQO #2 – Contingency soil samples may be collected and analyzed as proposed in this SSWP. Analytical results will be compared to background values for naturally occurring substances, and if above compared to screening values for human health and ecological risk assessment. The following decision rules will apply:

- If sample results are less than background concentrations for naturally occurring substances, and are nondetect for explosive compounds, the site will be recommended for NDAI relative to MC.
- If sample results for naturally occurring substances exceed background concentrations and human health screening values, or exceed human health screening values for

non-naturally occurring substances, the site will be recommended for additional investigation.

- If sample results for naturally occurring substances exceed background concentrations and ecological screening values but do not exceed human health screening values, or exceed ecological screening values for non-naturally occurring substances, additional evaluation of the data will be conducted in conjunction with the stakeholders to determine if additional investigation is warranted.
- Areas surrounding the batteries will be recommended for NDAI based on agreements made at the TPP meeting that there is little likelihood that MC would be found surrounding the batteries and that no soil sampling is required near the batteries.

1.8 MEC Technical Approach

The technical approach is based on the Work Plan (Shaw, 2006); *Final Technical Project Planning Memorandum* (Shaw, 2008); and the *Formerly Used Defense Sites, Military Munitions Response Program, Site Inspections, Program Management Plan* (USACE, 2005). In accordance with Section 3.1.1 of the Work Plan, the technical approach includes the following:

- Existing data will be used to document the presence or absence of MEC.
- A metal detector-assisted site reconnaissance will supplement the existing data in an attempt to identify evidence of MEC and/or MD at the ground surface, under vegetative cover, or beneath the surface.

If MEC is found during SI field activities, the following excerpted procedures will be followed, per Interim Guidance Document 06-05 and Safety Advisory 06-2 (see Appendix B for complete document):

“a. (1) The property owner or individual granting rights of entry to the property will be notified of the hazard and advised to call the local emergency response authority (i.e., police, sheriff, or fire department). The individual will also be informed that if they do not call the local response authority within 1 hour, the individual who identified the UXO item will notify the local emergency response authority.

b. (2) The local response authority will decide how to respond to the reported incident, including deciding not to respond (e.g., if the local response authority is already aware of the hazards on the property). If the local response authority decides to respond, the individual who identified the item or his designee will mark the location of the item and provide accurate location information to the emergency response authority. The individual who identified the item or his designee will generally remain in the area until the local response authority arrives, unless specifically indicated by the appropriate response authority that the individual may leave the area.”

“(c) Neither the U.S. Army Corps of Engineers personnel, nor their contractors have the authority to call EOD [Explosive Ordnance Disposal] to respond to an explosive hazard. This call is the responsibility of the local emergency response authority for FUDS properties and it must come through the proper chain of command on installations.”

1.9 SSWP Organization

This SSWP supplements the Work Plan (Shaw, 2006), which includes an Accident Prevention Plan and Site Safety and Health Plan (SSHP; in Appendix D), and a Sampling and Analysis Plan (SAP; in Appendix E) that includes both the USACE SAP and the Shaw SAP. The SAPs contain a Field Sampling Plan (FSP) and a Quality Assurance Project Plan. The Work Plan, as amended by this SSWP, governs work that will be implemented during the SI at the FUDS. This SSWP provides additional information not available in the Work Plan, including site information (background information, summary of historical documents evaluated, and resulting data needs), a discussion of activities to be conducted prior to mobilizing to the field, a presentation of field data to be collected, and appendices with supporting documents. Specifically, this SSWP includes the following sections:

- Section 1.0 Introduction,
- Section 2.0 Site Information,
- Section 3.0 Pre-Field Activities,
- Section 4.0 Site Inspection Activities,
- Section 5.0 Investigation-Derived Waste,
- Section 6.0 Proposed Schedule,
- Section 7.0 References,
- Figures,
- Tables,
- Appendix A Conceptual Site Model,
- Appendix B USACE Interim Guidance Document 06-05 and Safety Advisory 06-2, and
- Appendix C Site Safety and Health Plan Addendum.

2.0 Site Information

Unless otherwise referenced, the following historical and physical setting information in Sections 2.1 and 2.2 is taken from the ASR (USACE, 2003) and the *INPR Supplement* (USACE, 2004b). This section provides a summary of site-specific information not available in the Work Plan, which was used to profile the site in development of the CSM (Appendix A).

2.1 Installation History

Fort Columbia was purchased in 1864 from an early pioneer for use as a coastal defense site. The land was undisturbed until 1898 when concerns for coastal security resulting from the Spanish-American War renewed interest in construction of a modern seacoast defense system. At that time three batteries, Battery Ord, Battery Crenshaw, and Battery Murphy, and a mine casemate were constructed and completed by 1900. The first contingent of army regulars reported to the garrison in June 1903.

Fort Columbia provided a coastal defense system for the Columbia River in conjunction with Fort Canby and Fort Stevens through the end of World War II. In approximately 1910, the third gun emplacement at Battery Ord was declared unusable due to severe flooding problems at the gun emplacement. This gun emplacement was subsequently decommissioned and backfilled.

In 1918, the remaining two 8-inch guns at Battery Ord were removed. In 1921, the 3-inch rapid fire guns at Battery Crenshaw were removed and the battery was decommissioned. During World War I, a new mine casemate was constructed at Fort Columbia. The new casemate provided modern controls for the mines in the Columbia River. The dates that the river was first mined are not known, but the river was known to be mined during both World War I and II. Battery Murphy was the only operational battery after 1921. None of the artillery was ever fired at the enemy. Table 1 provides a list of munitions used at Fort Columbia.

Following World War I, Fort Columbia along with Fort Stevens and Fort Canby were placed in caretaker status, where only essential functions were performed to ensure survivability of the forts. In the summer of 1940, all operable gun batteries at the three coastal defense sites were activated. However, none of the minefields were laid at that time. Shortly after the start of World War II, buoyant mines were laid across the mouth of the Columbia River, which were soon replaced by M4 ground mines in early 1942. In 1941 and 1945, the mine casemate building was upgraded to provide higher survivability in case of attack and to support upgraded mining operations. An underwater audio listening system and electric switching system for firing the mines was also installed during the upgrade. In 1942, construction on Battery 246 was started but the guns were never installed.

Fort Columbia was manned for battle until the end of 1944 when it became apparent that Japan was no longer a threat to the coast. At that time, the manning of the fort was decreased and the 6-inch guns removed and shipped out. The gun mounts were dismantled and sold for scrap. The

minefield (Figure 2) was removed from the river and war material was shipped back to depots for redistribution. Fort Columbia reverted to caretaker status and awaited disposition. While all mines were removed following World War II, it is not known if any mines may have been lost from the minefield due to heavy current or storms.

In 1947 the Department of the Army declared Fort Columbia as surplus and in 1948 conveyed the property to the War Assets Administration for eventual disposal. In 1951 the War Assets Administration granted the state of Washington the property and that same year the state opened the Fort Columbia State Park. The site has remained a state park ever since.

2.2 Physical Setting

2.2.1 Access and Land Use

Fort Columbia is located along US Highway 101, 2 miles west of the Columbia River Bridge to Astoria, Oregon. All but 40 acres of the FUDS property is publicly owned, either by the Washington Parks and Recreation Commission, Pacific County, or the U.S. Government (unspecified agency). A parcel ownership map is shown on Figure 5. Prior to use of the site by the DoD as a coastal gun battery, the area was native vegetation. Following DoD use the site has been a state park. Land use is not expected to change in the future.

2.2.2 Topography and Climate

Fort Columbia lies within the Pacific Border Physiographic Province, Oregon Coast Range Subprovince. The topography of the area is steep with elevation rising from sea level to over 750 feet within one-half mile of the shoreline (Figure 2). Vegetation within the park consists of neatly mowed lawns with evergreen trees. The area surrounding the park is thick with a heavy forest canopy of fir, cedar, and hemlock, with a dense undergrowth.

The Fort Columbia area is located along the Pacific Coast of Washington State and receives approximately 80 inches of precipitation per year. Only in the months of July and August does the site receive a monthly average of less than 2-inches of rain. The average monthly high (66.8 degrees Fahrenheit) occurs in August and September and the average low temperature (36.1 degrees Fahrenheit) occurs in January. The average annual snowfall is only 1.2 inches.

2.2.3 Surface Water

The Columbia River is adjacent to Fort Columbia, and forms the southern property boundary. The average river flow rate at the mouth of the river is 275,000 cubic feet per second. The Chinook River crosses the extreme north boundary of the property.

2.2.4 Geology and Hydrogeology

The bedrock beneath Fort Columbia consists of lower Tertiary volcanic and sedimentary rocks. Soil units present include the Knappton silt loam and the Montesa silt loam (Natural Resources Conservation Service, 2007).

Several wells are located in the vicinity of Fort Columbia. However, there are no wells within the boundary of Fort Columbia. Nearby wells are typically shallow, less than 25-feet depth and static water levels are within 10-feet depth. No specific information could be located concerning the hydrogeology and groundwater flow direction of the Fort Columbia vicinity. However, it is assumed, based on the proximity to the Columbia River, groundwater flow is toward the river.

2.3 Summary of Previous Investigations

2.3.1 Range Clearance Documents

There have been no reported range clearance activities at Fort Columbia other than the disarmament of the guns and minefield at the end of World War II. All firing was done over and into the Columbia River (USACE, 2003).

2.3.2 Inventory Project Report

An Inventory Project Report (INPR) was completed for Fort Columbia in 1992 (USACE, 1991). The INPR identified that Fort Columbia was formerly used by the DoD. The INPR identified that there were seven storage tanks on the site that had been unused since the Army vacated the property. An independent removal action was completed in November and December 1993 (USACE, 1996). Six of the seven storage tanks were found and removed. One tank was not located. Sampling results indicated that there was no residual contamination (gasoline or diesel) above cleanup action levels.

2.3.3 Archives Search Report

The USACE Rock Island District completed an ASR in December 2003 (USACE, 2003). The ASR included a records search and site visit. The ASR indicated that the only known munitions used at Fort Columbia were shells related to the artillery batteries and mines used for mining the mouth of the Columbia River. There have been no reports of MEC at Fort Columbia. However, an historian interviewed in 2003 for the ASR reported that an empty buoyant mine was recovered at the mouth of the Columbia River in about 1993.

2.3.4 INPR Supplement

In 2004, the USACE completed an *INPR Supplement*, which identified Battery Murphy as the only range at Fort Columbia (USACE, 2004b). An area of 5,841 acres was assigned to the range with the majority of the range over the Columbia River. The range was ranked according to the Risk Assessment Code procedure to address explosives safety hazards. Possible scores range from 5 (lowest risk category) to 1. The range received a Risk Assessment Code score of 5.

2.4 Other Land Uses that May Have Contributed to Contamination

There are no other known land uses that may have contributed contamination of MC to the FUDS.

2.5 *Munitions Information*

When Fort Columbia was first manned, three gun batteries were in place. Battery Ord had three 8-inch guns, Battery Crenshaw was fitted with three 3-inch rapid fire guns, and Battery Murphy had a pair of 6-inch guns. A former gunner at Fort Columbia during World War II reported that 6-inch target practice and occasionally 37 millimeter solid practice rounds were fired from Fort Columbia. Table 1 lists the munitions and munitions constituents used at Fort Columbia.

The gun at the third gun emplacement at Battery Ord was removed about 1910 due to severe flooding problems in the battery. The remaining guns at Battery Ord were removed in 1918. The guns at Battery Crenshaw were removed in 1921. There is no documentation that indicates that the guns were fired. However, practice firing occurred, using solid projectiles as reported by a World War II veteran stationed at Fort Columbia.

Buoyant mines were laid in the river during World War I and again shortly after the bombing of Pearl Harbor in December 1941 but were replaced with M4 ground mines in 1942. During the TPP meeting the State Parks representative indicated that there is no evidence that any maintenance was completed on the mines at Fort Columbia and that the mines likely came preassembled to the site.

During the TPP meeting the State Parks representatives indicated that discussions with former Fort Columbia military personnel suggested that there likely had been two small arms ranges at the site. The original one was near the present day Chinook County Park. The location of the small arms range has been reclaimed by the Columbia River and is now underwater. The second location is suggested as being near the entrance to the park on the north side of Highway 101. All that is known is that they fired into the hillside.

3.0 Pre-Field Activities

3.1 Coordination with State Historic Preservation Office

The Washington Department of Archaeology and Historic Preservation (DAHP) has been contacted to determine if there are any historical or cultural sites located at the FUDS, and if so, to determine if there is the potential for impact from SI activities. The DAHP recommended that consultation with nearby tribes and an archaeological survey be conducted. The USACE Seattle District will conduct an archaeological evaluation of the FUDS, which will be documented in the SI Report.

3.2 Coordination Regarding Natural Resources

The Washington Department of Fish and Wildlife (WDFW), Washington Department of Natural Resources Natural Heritage Program, and U.S. Fish and Wildlife Service were contacted to determine whether any threatened or endangered species are present at the FUDS. The range and other areas do qualify as Important Ecological Places or Sensitive Environments as defined by the USACE (2006) or EPA (1997). Database searches by the WDFW indicated that “priority wildlife heritage points” and occupied Marbled Murrelet sites are present on the FUDS (WDFW, 2008). Also inquiries on the U.S. Fish and Wildlife Service website for Pacific county, Washington (www.fws.gov/westwafwo/speciesmap/Pacific.html) indicated that federally listed species may use the FUDS. The Washington Department of Natural Resources (WDNR) indicated that there were no records for rare plants or high quality native ecosystems in the vicinity of the FUDS (WDNR, 2008).

3.3 Review of Historical Aerial Photographs

A review of historical (1975) and recent (2006) aerial photographs of the FUDS has been completed. Locations of known buildings and batteries are visible on both photographs. There was no evidence on the aerial photographs of the small arms range reported to be located near the entrance to the FUDS.

3.4 Coordination of Rights of Entry

The Project Manager from the USACE Seattle District office is responsible for obtaining the right of entry for each property where SI activities will be conducted. Access to identified properties is necessary for conducting field activities. Table 2 identifies the properties of interest and the status of each right of entry.

3.5 Equipment

A hand-held all-metals detector (Fisher 1266-X or equivalent) will be used to support the reconnaissance effort. A hand-held global positioning system (GPS) unit and digital camera will be used for traverses and to document any surface remains, document the reconnaissance survey, identify the location of MEC, if found, and document sampling locations.

3.6 Communications

The primary means of on-site communication will be cellular telephones. The two-person Field Team (and any other accompanying parties) will remain together throughout all aspects of the field activities.

3.7 Training and Briefing

Additional training will be conducted on site during the Daily Tailgate Safety Briefing, to include awareness of endangered species, culturally sensitive areas, and anticipated ordnance types. In addition, emphasis will be placed on the known presence of biota at the site.

4.0 *Site Inspection Activities*

The SI activities proposed at the FUDS are site reconnaissance and soil sampling. All SI field activities will be conducted in accordance with the SSHP Addendum (Appendix C). The SSHP Addendum is a supplement to the program-wide Accident Prevention Plan and SSHP contained in the Work Plan (Shaw, 2006). All site inspection field activities will be documented in the field logbook.

4.1 *Key Personnel*

This section identifies key project personnel and their specific roles and responsibilities for each SI activity conducted at the FUDS. Additionally, this section defines the responsibilities, authority, and the interrelationships of all personnel who manage, perform, and verify activities affecting quality, particularly for personnel who need the organizational freedom and authority to:

- Initiate action to prevent the occurrence of nonconformance,
- Identify and record quality problems,
- Initiate, recommend, or provide solutions through designated channels,
- Verify the implementation of solutions, and
- Control further processing, delivery, or installation of nonconforming items until the deficiency or unsatisfactory condition has been corrected.

Project Manager – The Shaw Project Manager will have overall responsibility, authority, and accountability for the project. Mr. Peter Kelsall is the Project Manager. He will provide additional management or technical support when needed and will serve as the final reviewer on all technical documents produced for the project.

Chemical Quality Control Officer – The Shaw Chemical Quality Control Officer shall ensure that all chemistry-related objectives, including responsibilities for DQO definitions, sampling and analysis, project requirements for data documentation and validation, and final project reports are attained. Mr. Tim Roth will serve as the Chemical Quality Control Officer for this project.

Health and Safety Manager – The Shaw Health and Safety Manager is responsible for the development and implementation of the SSHP and SSHP Addendum for the SI. Mr. David Mummert will serve as the Health and Safety Manager for this project.

Technical Lead – The Shaw Technical Lead will oversee the technical aspects of the inspection activities. Mr. Dale Landon will serve as the Technical Lead for this site. Although his presence is not required, Mr. Landon may act as a team member during the field activities. He may also serve as an alternate Field Team Leader.

Field Team Leader – The Shaw Field Team Leader will be responsible for the management and execution of all field project activities in accordance with the approved Work Plan (Shaw, 2006), and federal, state, and local laws and regulations. Mr. Dale Landon will serve as the Field Team Leader for this site. The Field Team Leader will function as the primary point of contact for the stakeholders and field personnel, and will document technical progress, needs, potential problems, and recommended solutions.

UXO Technician – The UXO Technician will be responsible for the UXO avoidance measures to be implemented during field activities. One of the following individuals will serve as the UXO Technician: David Watkins (1420), Rob Irons (1137), Jim Bayne (1212), Rueben Rhodes (0169), Ron Stanfield (1161), or Dave Van Deman (1057).

4.2 Field Reconnaissance

This section discusses the visual surface reconnaissance planned for the AOCs.

4.2.1 Objectives

A visual surface reconnaissance will be conducted along a meandering path through portions of the FUDS (Figure 6). The reconnaissance has three main objectives:

- Document general site conditions (field logbook, photographs, GPS waypoints) for each AOC, even if MEC has been documented from previous investigations or from SI reconnaissance;
- Identify and locate MEC, MD, and/or other evidence of range activities that may be present in order to test and verify the CSM (Appendix A) and to “ground truth” features seen on aerial photographs (e.g. buildings, artillery batteries); and
- Optimize sample locations, biased to locations where MC is most likely to be present.

UXO avoidance will be conducted during SI site activities. If MEC is observed at any point during field activities, the field team will respond according to the requirements of the SSHP and SSHP Addendum (Appendix C), and make appropriate notifications in accordance with USACE direction (Appendix B). Further reconnaissance for the purpose of determining the presence or absence of MEC will be terminated, and further reconnaissance will be limited to the minimum amount necessary to document site conditions and determine appropriate sample locations. If evidence of munitions activity is observed that is inconsistent with the CSM described in Appendix A, notification will be made to the USACE and WDOE, and a variance to this SSWP would be submitted to initiate appropriate changes to the SI approach.

4.2.1.1 Document General Site Conditions

The following conditions, if present, will be recorded in the field logbook and documented by digital photographs:

- Access limitations (fencing, gates, rivers, buildings, etc.);

- Land use (agriculture, development, buildings, campgrounds, dumping, etc.);
- Land disturbance (destruction of historic berms, excavation, fill, subsidence, etc.);
- Type and condition of vegetative cover and habitat (noting especially any distressed populations);
- Presence or potential presence of wildlife;
- Wetlands or other features that would qualify the site as an Important Ecological Place;
- Soil conditions;
- Presence or absence of surface water (streams, ponds, etc.);
- Direction of surface water flow;
- Location and condition of groundwater wells;
- Evidence of use of surface water or groundwater for human consumption, stock watering, or irrigation;
- General physical setting and topography;
- Any activities that could result in contamination, and
- Photograph details (GPS waypoint, key features, direction, time, distance to key objects, etc.).

4.2.1.2 Document Evidence of Military Activities

Table 1 lists munitions and the associated MC used at the artillery battery and potential small arms range. The following conditions will be recorded in the field logbook and documented by digital photographs and GPS (Garmin GPSMAP 60csx or equivalent):

- Presence or absence of MEC, shell casings, bullets or bullet fragments, or other MD; and
- Location and physical description of range features such as artillery batteries, firing points, berms, targets, and historical military signs.

Based on USACE guidance, reconnaissance of this type will be limited to the identified former range areas, in the absence of evidence suggesting munitions-related activities in other portions of the FUDS.

4.2.1.3 Sample Locations

Reconnaissance will also be used to select optimal sample locations; such as, samples will be biased to locations with evidence of former munitions activity, if observed. The following conditions will be recorded in the field logbook (include text and sketches, when applicable) and documented by digital photographs:

- Rationale for selecting sample location (e.g., presence of MEC or MD, staining, distressed vegetation);
- Description of sample location (e.g., face of berm, in front of target);

- Soil conditions (as appropriate); and
- Surface water or sediment conditions (as appropriate).

Background sample locations will be selected in areas that do not appear to have been impacted by past site operations based on criteria such as similarity to soils within the AOC (soil samples), site accessibility, wind direction (soil samples), and groundwater flow direction (groundwater samples).

4.2.2 Reconnaissance Methods

The site reconnaissance will be performed by conducting a visual inspection of appropriate and accessible portions of the range by a field team of two or more persons, including a qualified UXO technician. The UXO technician will supplement the visual inspection with the use of a hand-held all-metals detector in areas where vegetation or soil cover may obscure potential munitions-related objects. Prior to each day's use, the detector will be field checked for proper operation. The path walked during the reconnaissance will be recorded using a hand-held GPS unit. Reconnaissance will not include detailed mapping; however, GPS waypoints and tracks will be presented on SI figures. The reconnaissance effort will be concentrated in the general vicinity of the batteries and the area of the reported small arms range. If GPS reception is degraded, locations for the reconnaissance routes and any samples collected will be recorded on topographic maps using pace and compass mapping methods.

The all-metals detector will generally be used in areas where it would be difficult to see objects on the ground surface because of vegetation or other site conditions. The all-metals detector may also be used around targets or in areas where subsurface MEC may reasonably be expected. The all-metals detector may not be used in portions of the AOC if the ground surface is visible and there is no visual evidence indicating the presence of ferrous munitions-related objects, or in areas where interference from ferrous objects unrelated to munitions, such as buried utilities, are present.

4.2.3 Extent of Reconnaissance

Site reconnaissance will use available aerial photographs and a Geographic Information System base map developed from the ASR and other sources (USACE, 2003). Field crews will be provided both current and historical aerial photographs. Information shown on the reconnaissance base map will include AOC boundaries, property boundaries, information from reported MEC findings, topography, and current roads and buildings. One objective of reconnaissance is to "ground truth" features seen on aerial photographs (e.g., if targets are still visible, or if buildings have been removed or added).

The reconnaissance effort will be focused on the AOCs and may be further concentrated in areas where MEC or MC is most likely to be found based on the CSM. General site conditions will be documented throughout the AOC and as appropriate in other parts of the FUDS.

The reconnaissance effort will be concentrated in the areas of the batteries, mine casemate buildings, and the reported former small arms range (Figure 6). Reconnaissance will also extend into selected other portions of the AOC. The anticipated total length of the meandering path is approximately 6,500 linear feet.

4.3 Field Sampling

This SSWP details sampling to be conducted at the FUDS as discussed during the TPP meeting and documented in the *Final TPP Memorandum* (Shaw, 2008). The possible collection of contingency soil samples is proposed for the reported small arms range. Sample location rationale is presented in Table 3.

In all instances, samples will be collected using clean, new, disposable sampling equipment, such as, a spoon or scoop and bowl. If nondisposable sampling tools are used, they will be decontaminated between samples in accordance with Section 6.8 of the Project Sampling and Analysis Plan provided in the Work Plan (Shaw, 2006). Nondisposable tools, such as a spade, shovel, or trowel, may be used to remove vegetation, roots, and gravel prior to collection of the soil samples. Soil samples will be collected in accordance with this section and with the SAP/FSP Section 6.1 and Shaw Standard Operating Procedures T-FS-101 and T-FS-124 in Appendix E of the Work Plan. Sample designations and quality assurance/quality control sample requirements are summarized in Table 4.

4.3.1 Soil Sampling

Two contingency surface soil samples may be collected from the small arms range, but only if the range can be located during visual reconnaissance activities. Locations will be selected in the field and will be biased to firing target areas. Figure 6 shows the reported location of the small arms range and potential sampling locations. The soil samples, if collected, will be analyzed for lead only.

4.3.2 Background Sampling

If the small arms range is located and the two contingency soil samples collected, three background soil samples will be collected and analyzed for lead using the same procedures as the small arms range soil samples. The background soil sampling locations will be selected during field activities and will be located in areas where minimal human activities have occurred.

4.3.3 Quality Assurance/Quality Control Samples

Quality control samples, including field duplicates and matrix spike/matrix spike duplicate samples, will be collected as detailed in Table 4. The USACE NWO Military Munitions Design Center has directed that no quality assurance (field split) samples will be collected for the SI at this site.

4.3.4 Sample Preservation, Packaging, and Shipping

Sample preservation and packaging are provided in the Shaw SAP/FSP Tables 4-1 and 4-2 in Appendix E of the Work Plan (Shaw, 2006). Sample shipment will follow the procedures specified in Section 4.0 of the Shaw SAP/FSP. Completed analysis request/chain-of-custody records will be secured and included with each shipment of coolers per Section 7.1.3 of the Shaw SAP/FSP. Samples will be shipped to the following laboratory:

GPL Laboratories, LLLP

7210A Corporate Court

Frederick, Maryland 21703

Phone: 301.694.5310

Fax: 301.620.0731

Attention: Sample Receiving/Virginia Zusman

4.4 Analytical Program

Soil samples will be analyzed for lead by EPA SW-846 Method 6020A. The soil samples will be passed through an ASTM International No. 10 (2 millimeter) wire mesh sieve at the laboratory prior to analysis for lead in order to remove coarser particles and foreign objects, including large metallic lead fragments from bullets, which have a low degree of bio-availability (Interstate Technical and Regulatory Council, 2003).

Chemical data will be reported via a hard-copy data package and electronic format following the requirements described in the Shaw SAP/FSP Sections 7.1 and 7.2 (Appendix E) of the Work Plan and applicable portions of the USACE Quality Assurance Project Plan (Shaw, 2006). These data deliverables will be validated in accordance to the requirements referenced in Section 8.2 of the Shaw SAP/FSP.

4.5 Background and Screening Values

Since the body of background data is limited, the site-to-background comparison will be conducted according to guidance for SI activities and HRS scoring (EPA, 1992). Background concentrations for analytes are taken to be the maximum values observed in the limited background data set (EPA, 1995). A comparison is then made to determine if a hazardous substance in the media is “significantly above the background level” according to the HRS criteria (40 CFR Appendix A to Part 300, Table 2-3):

- If the sample measurement is less than or equal to the sample quantitation limit, no observed release is established.
- If the sample measurement is greater than or equal to the sample quantitation limit, then:
 - If the background concentration is not detected, an observed release is established when the sample equals or exceeds the sample quantitation limit.

- If the background concentration equals or exceeds the detection limit, an observed release is established when the sample is three times or more above the background concentration.

Background threshold levels, for comparison to site data per the above HRS criteria, are three times the maximum detected background concentration. For analytes not detected in background samples, the background threshold is the sample quantitation limit.

Site sample data that exceed background concentrations will be compared to the appropriate human health screening criteria to determine if additional investigation should be recommended. Table 5 lists the human health screening criteria for this SI. Table 6 lists the ecological screening criteria for this SI. A consensus concerning the criteria to use was reached during the TPP meeting. The human health screening criteria for surface soil are the EPA Region 9 Preliminary Remediation Goals.

4.6 Site-Specific Information/Data

In addition to observations and data directly obtained from field activities discussed in Sections 4.2 and 4.3, site-specific information/data will be collected for the FUDS to supplement that found in the ASR and *INPR Supplement* (USACE, 2003 and 2004b). Initial information collected has been incorporated in this SSWP. This site information will be supplemented using research via Internet searches, requests from agency contacts (DAHP, WDFW, Washington Department of Natural Resources, U.S. Fish and Wildlife Service, etc.), and site contacts, if applicable. Site-specific information/data will include geology, climate, hydrogeology, federally and state-listed threatened and endangered species known to be or potentially be on site, sensitive habitats, wetlands, cultural and archeological resources, water resources, vegetation, waste disposal sites, and impact mitigation measures.

Further data collection will be conducted to complete the MRSPP scoring sheets and to collect the pertinent MC-related HRS scoring information. The primary information needed to complete the MRSPP scoring, such as hazard type (i.e., explosive or chemical) and accessibility, will come from historical site documents (ASR, *INPR Supplement*, etc.) (USACE, 2003 and 2004b). To further supplement current on- and off-site information needed for receptor scoring, additional data will be collected on the current on- and off-site activities/structures, population density, CERCLA sites, Resource Conservation and Recovery Act sites, well locations, and water supply information.

5.0 Investigation-Derived Waste

Investigation-derived waste will be managed in accordance with Work Plan Section 3.7 and Shaw SAP/FSP Section 9.0 in Appendix E of the Work Plan (Shaw, 2006). All investigation-derived waste is presumed nonhazardous unless field observations indicate otherwise. The following types of investigation-derived waste will be managed as specified in Appendix E of the Work Plan:

- Personal protective equipment and disposable equipment (i.e., gloves, disposable sampling scoop): Bagged and routed to a municipal landfill;
- Excess surface soil: Returned to the source (i.e., ground surface); and
- Water used in cleaning of reusable equipment: Poured on ground surface.

6.0 *Proposed Schedule*

The proposed schedule for field activities and reporting is provided below: The timing of the field activities assumes there will be no delays because of inclement weather.

- Final SSWP Submitted July 2008.
- Field Work Begins July 2008.
- Draft SI Report Submitted October 2008.
- Draft SI Report Comments Due November 2008.
- Draft Final SI Report Submitted December 2008.
- Draft Final SI Report Comments Due January 2009.
- Second TPP Meeting February 2009.
- Final SI Report Submitted February 2009.

7.0 References

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[gov/cgi-bin/waisgate.cgi?W AISdocID=209840153119+0+0+0&W AISaction=retrieve](http://frwebgate5.access.gpo.gov/cgi-bin/waisgate.cgi?W AISdocID=209840153119+0+0+0&W AISaction=retrieve). January 7, 2003.

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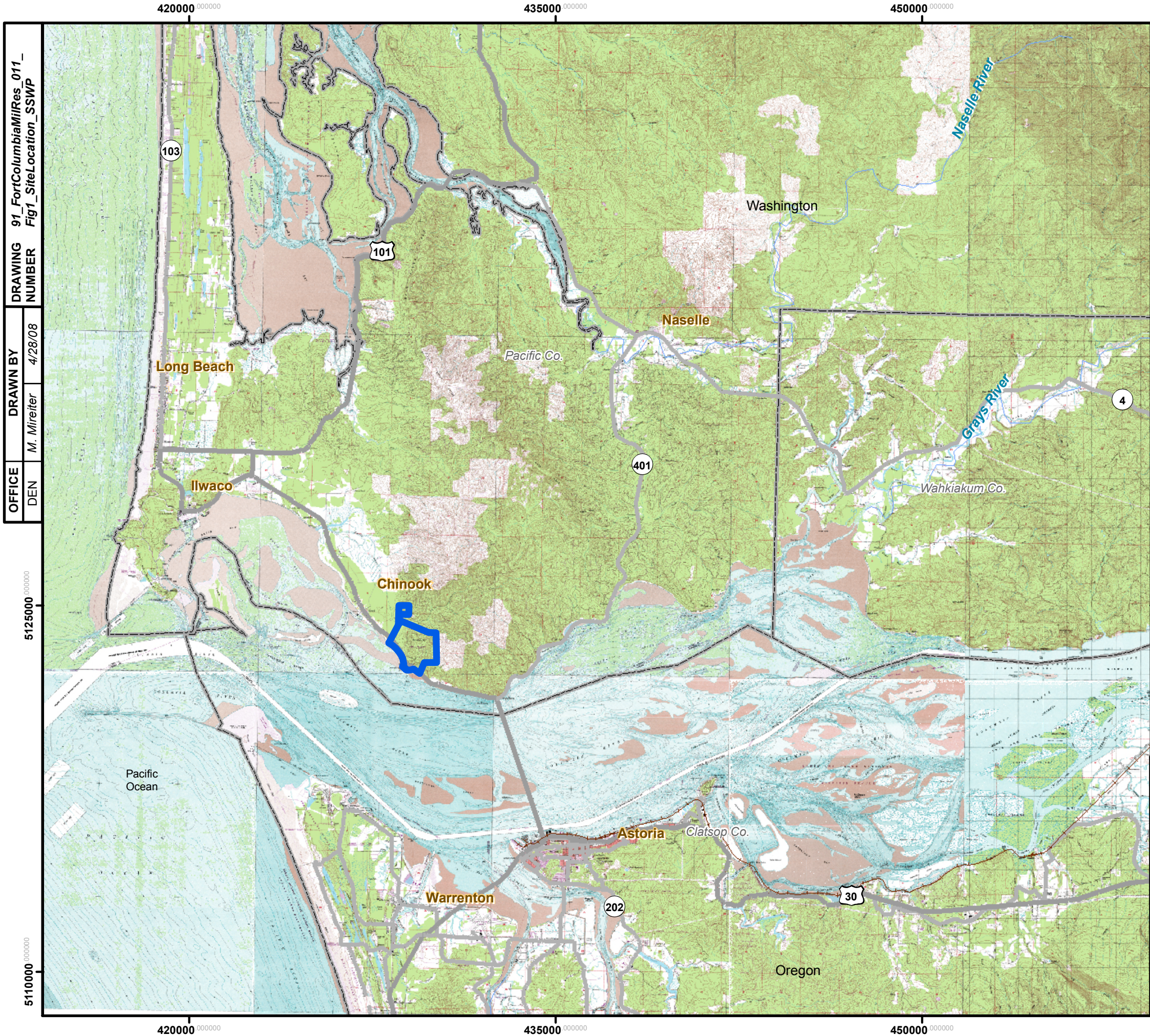
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
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Figures

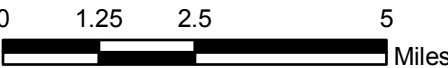


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Legend

 Fort Columbia Military Reservation FUDS Property

- NOTES:
- 1) FUDS property boundary was derived from the Fort Columbia Military Reservation ASR (USACE, 2003).
 - 2) Topographic maps (Pacific and Clatsop Counties) obtained from the U.S. Department of Agriculture, Service Center Agencies, 1999.



REFERENCE/PROJECTION: NAD 83 UTM Zone 10N

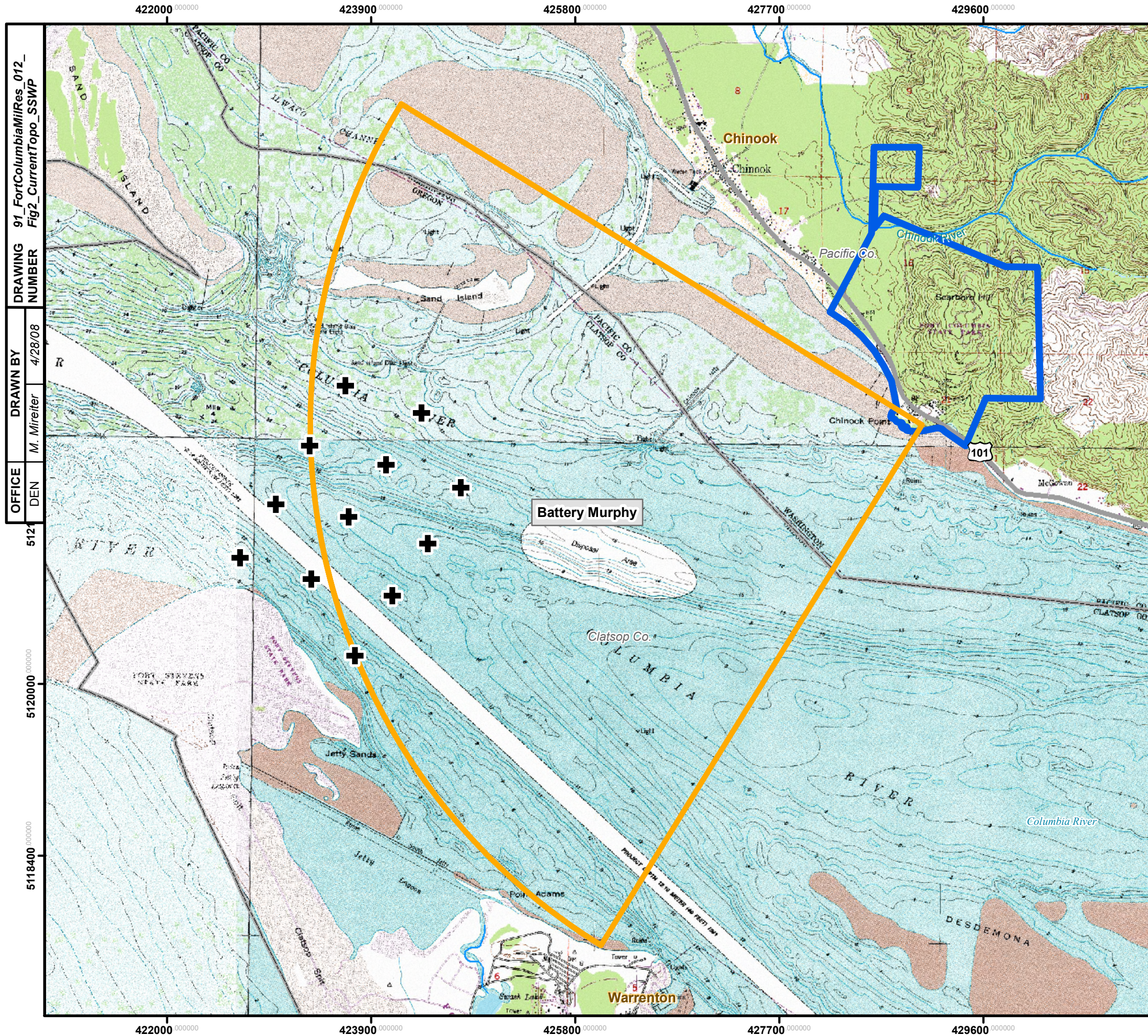


U.S. ARMY CORPS OF ENGINEERS
OMAHA DESIGN CENTER

FIGURE 1
SITE LOCATION

FORT COLUMBIA MILITARY RESERVATION
FUDS PROPERTY NUMBER F10WA0314





Legend

Fort Columbia Military Reservation FUDS Property

Range in the MMRP Inventory

Mine Location

NOTES:
1) FUDS property boundary was derived from the Fort Columbia Military Reservation ASR (USACE, 2003). Range boundary was derived from the Fort Columbia Military Reservation ASR Supplement (USACE, 2004) and revised based on the location of Battery Murphy.
2) Topographic map (Pacific County) was obtained from the U.S. Department of Agriculture, Service Center Agencies, 1999.



REFERENCE/PROJECTION: NAD 83 UTM Zone 10N

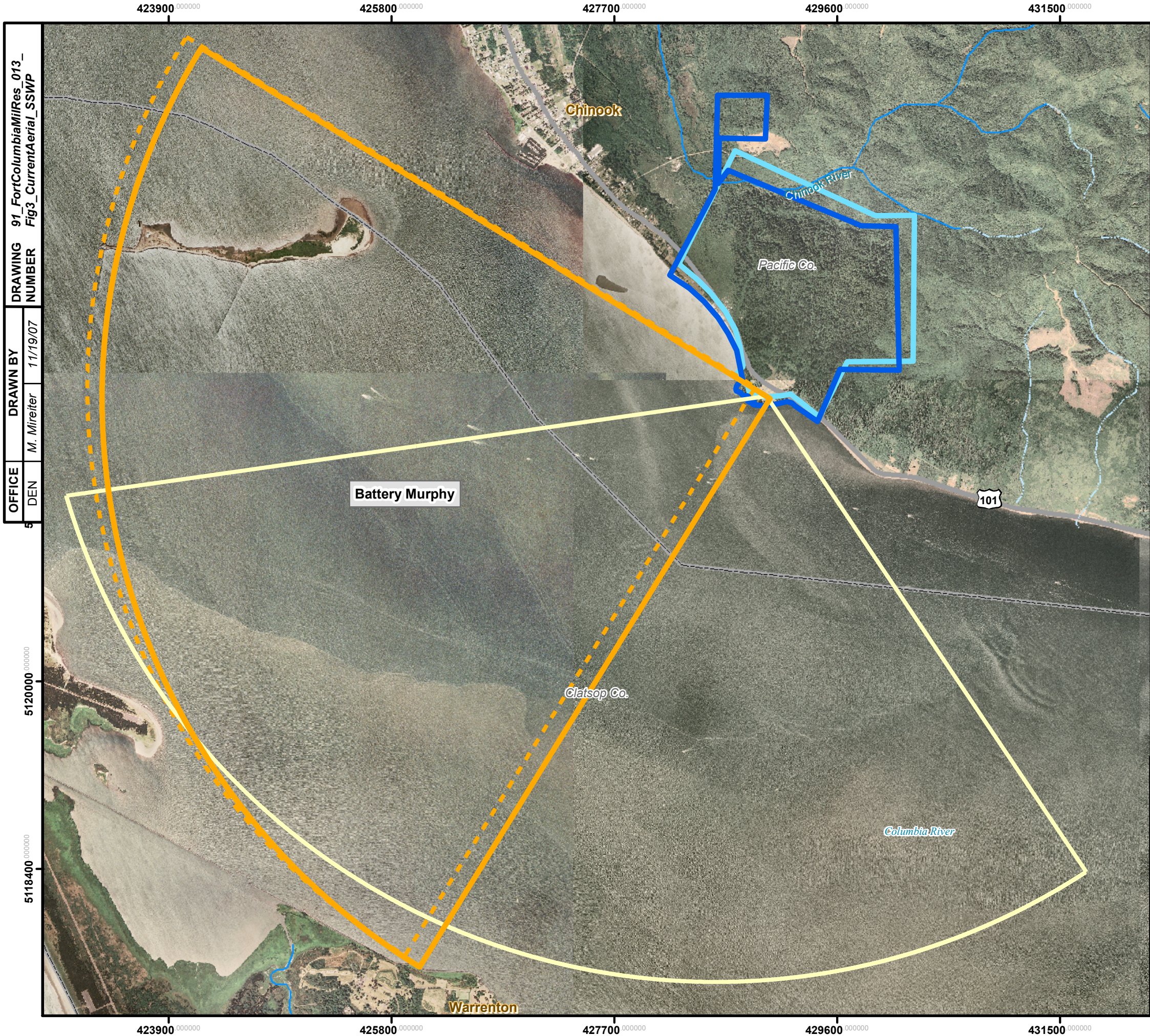


U.S. ARMY CORPS OF ENGINEERS
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FIGURE 2
CURRENT TOPOGRAPHIC MAP

FORT COLUMBIA MILITARY RESERVATION
FUDS PROPERTY NUMBER F10WA0314





91_FortColumbiaMilRes_013_Fig3_CurrentAerial_SSWP

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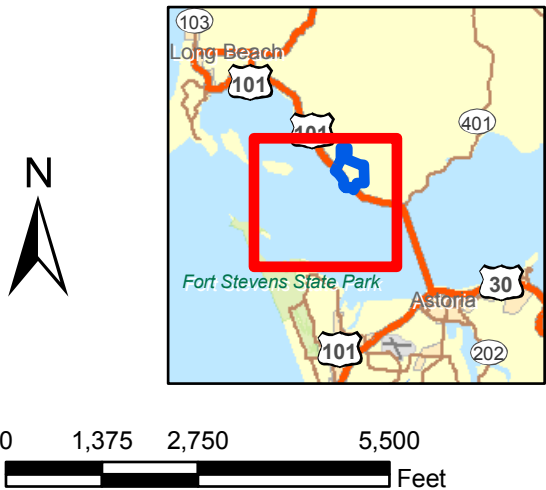
Legend

- Fort Columbia Military Reservation FUDS Property-ASR Location
- Fort Columbia Military Reservation FUDS Property-ASR Supplement Location
- Range in the MMRP Inventory-ASR Location
- Range in the MMRP Inventory-ASR Supplement Location
- Range in the MMRP Inventory-ASR Supplement Location Revised

NOTES:

1) FUDS property boundary was derived from the Fort Columbia Military Reservation ASR (USACE, 2003). Range boundary was derived from the Fort Columbia Military Reservation ASR Supplement (USACE, 2004) and revised based on the location of Battery Murphy.

2) Aerial photograph (Pacific County) obtained from the U.S. Department of Agriculture, Service Center Agencies; photograph is from the USDA-APFO National Agricultural Inventory Project (NAIP), 2006.



REFERENCE/PROJECTION: NAD 83 UTM Zone 10N



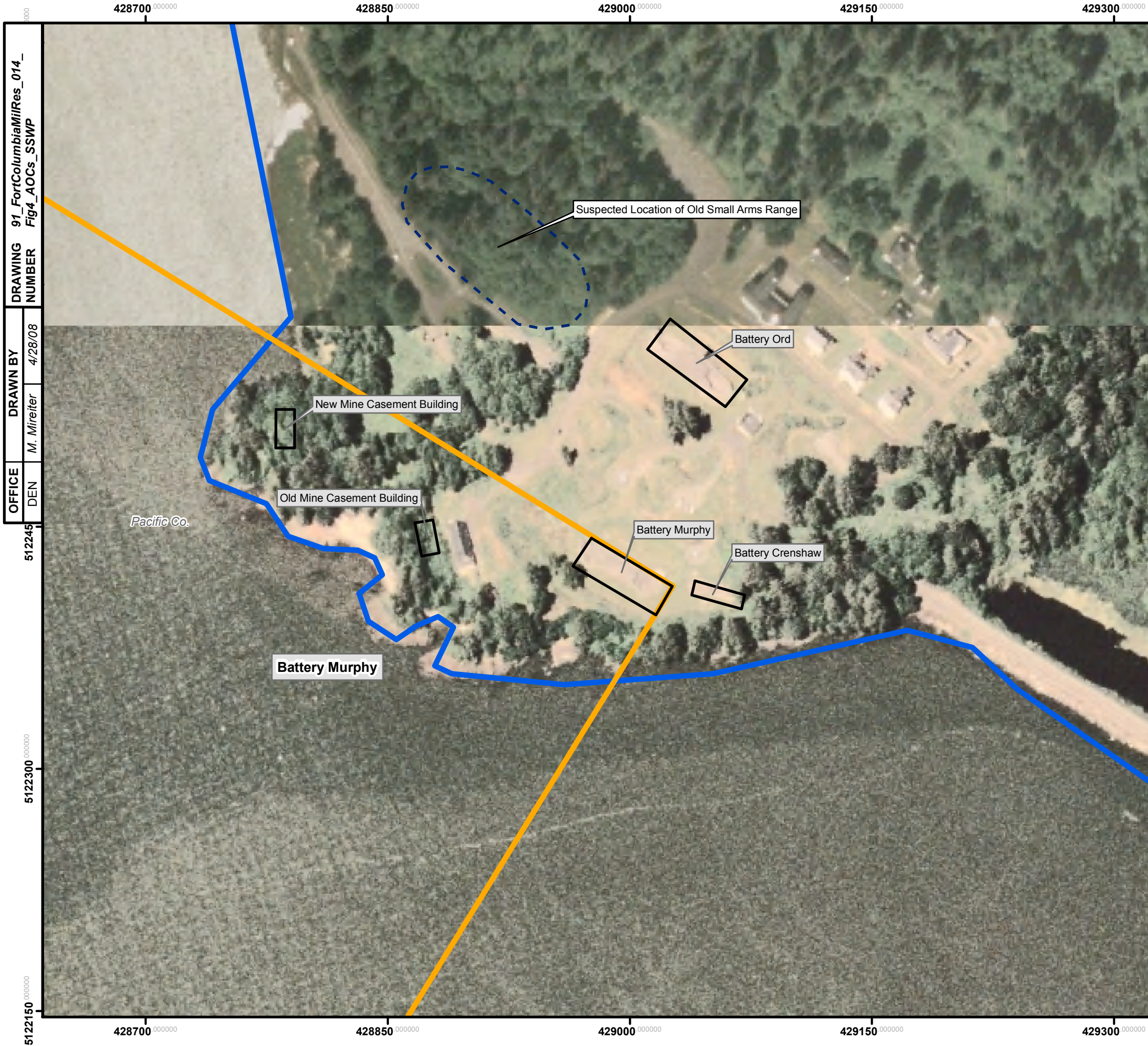
U.S. ARMY CORPS OF ENGINEERS
OMAHA DESIGN CENTER

FIGURE 3

CURRENT AERIAL PHOTOGRAPH

FORT COLUMBIA MILITARY RESERVATION
FUDS PROPERTY NUMBER F10WA0314



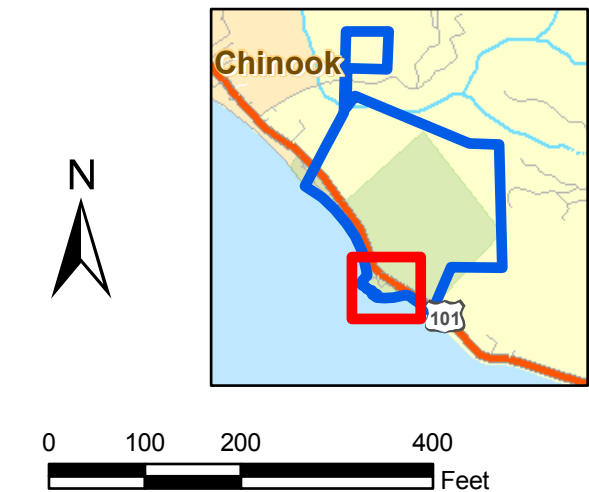


Legend

- Fort Columbia Military Reservation FUDS Property
- Range in the MMRP Inventory
- Suspected Location of Old Small Arms Range

NOTES:

- 1) FUDS property boundary was derived from the Fort Columbia Military Reservation ASR (USACE, 2003). Range boundary was derived from the Fort Columbia Military Reservation ASR Supplement (USACE, 2004) and revised based on the location of Battery Murphy.
- 2) Aerial photograph (Pacific County) obtained from the U.S. Department of Agriculture, Service Center Agencies; photograph is from the USDA-APFO National Agricultural Inventory Project (NAIP), 2006.



REFERENCE/PROJECTION: NAD 83 UTM Zone 10N


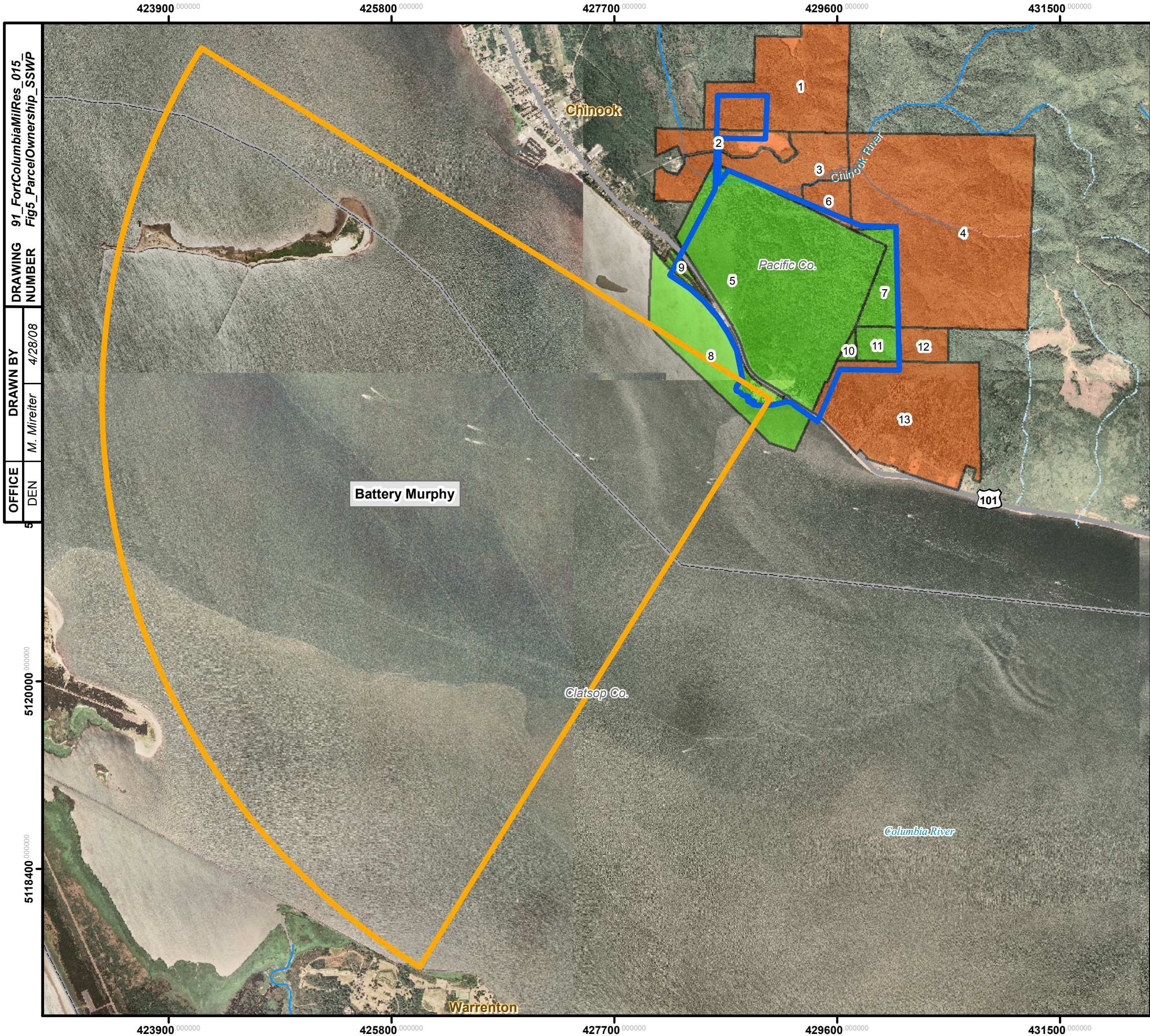
 U.S. ARMY CORPS OF ENGINEERS
OMAHA DESIGN CENTER

FIGURE 4

SITE LAYOUT AND AREAS OF CONCERN

FORT COLUMBIA MILITARY RESERVATION
FUDS PROPERTY NUMBER F10WA0314



Legend

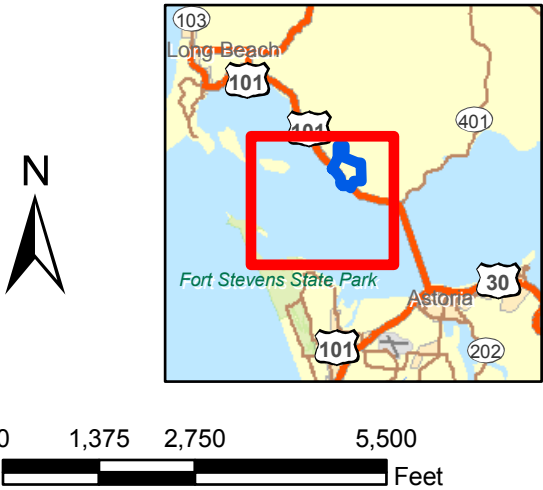
- Fort Columbia Military Reservation FUDS Property
- Range in the MMRP Inventory
- Taxlot Parcel - Private
- Taxlot Parcel - Public
- 1 Parcel ID Number

NOTES:

1) FUDS property boundary was derived from the Fort Columbia Military Reservation ASR (USACE, 2003). Range boundary was derived from the Fort Columbia Military Reservation ASR Supplement (USACE, 2004) and revised based on the location of Battery Murphy.

2) Parcel data obtained from Pacific County.

3) Aerial photograph (Pacific County) obtained from the U.S. Department of Agriculture, Service Center Agencies; photograph is from the USDA-APFO National Agricultural Inventory Project (NAIP), 2006.



REFERENCE/PROJECTION: NAD 83 UTM Zone 10N

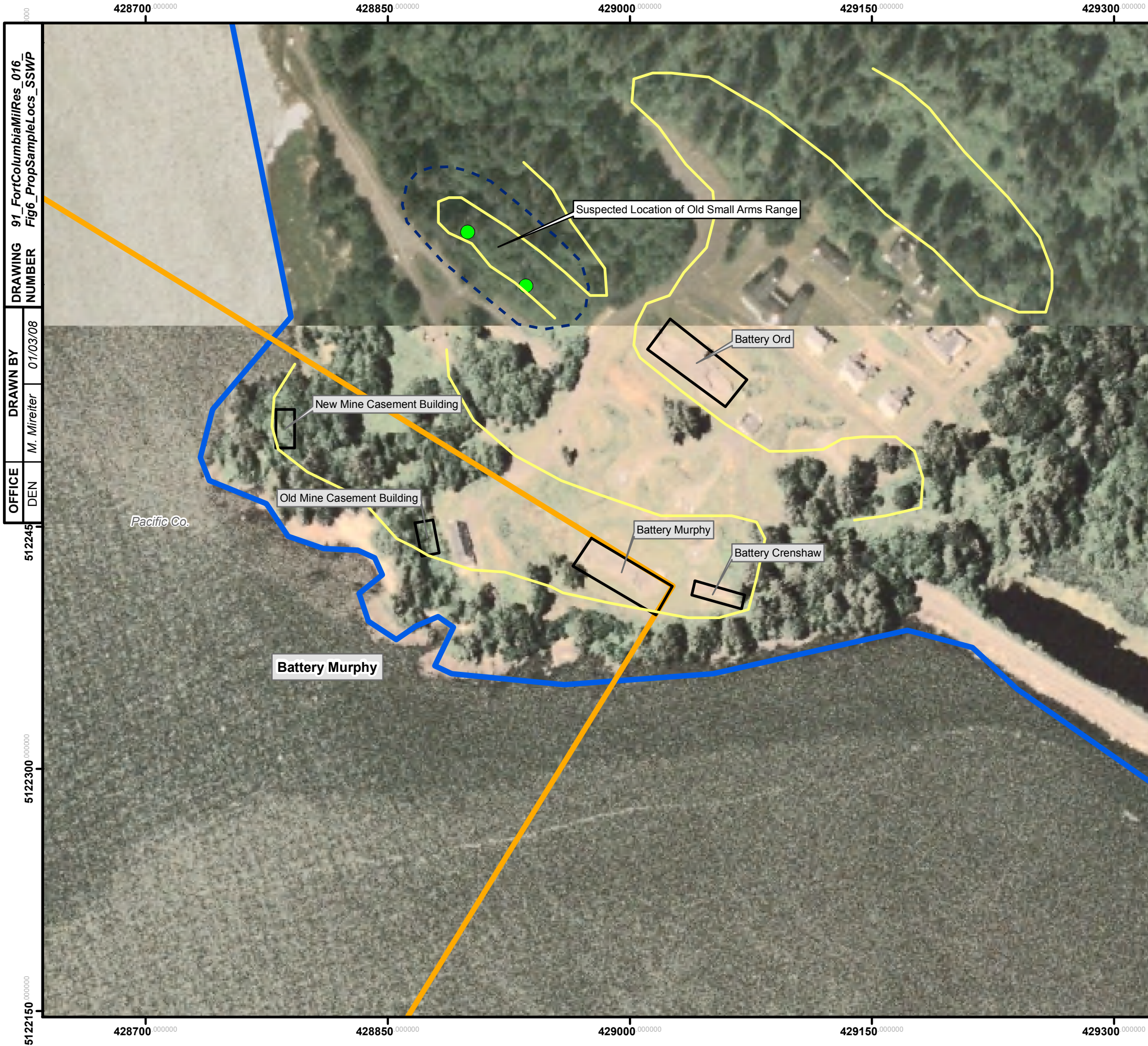


U.S. ARMY CORPS OF ENGINEERS
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FIGURE 5
PARCEL OWNERSHIP

FORT COLUMBIA MILITARY RESERVATION
FUDS PROPERTY NUMBER F10WA0314





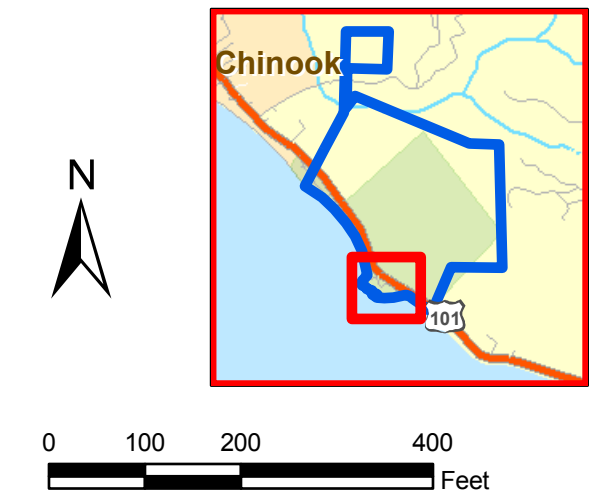
Legend

- Fort Columbia Military Reservation FUDS Property
- Range in the MMRP Inventory
- Suspected Location of Old Small Arms Range
- Approximate Reconnaissance Route
- Contingency Soil Sample Locations

NOTES:

1) FUDS property boundary was derived from the Fort Columbia Military Reservation ASR (USACE, 2003). Range boundary was derived from the Fort Columbia Military Reservation ASR Supplement (USACE, 2004) and revised based on the location of Battery Murphy.

2) Aerial photograph (Pacific County) obtained from the U.S. Department of Agriculture, Service Center Agencies; photograph is from the USDA-APFO National Agricultural Inventory Project (NAIP), 2006.



REFERENCE/PROJECTION: NAD 83 UTM Zone 10N


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FIGURE 6
PROPOSED RECONNAISSANCE ROUTE
AND CONTINGENCY SAMPLE LOCATIONS

FORT COLUMBIA MILITARY RESERVATION
FUDS PROPERTY NUMBER F10WA0314

Tables

Table 1
Munitions and Munitions Constituents
Fort Columbia Military Reservation

Area of Concern		Munitions	Munitions Constituents
Fort Columbia Military Reservation	Small Arms Range	Small Arms (.30, .45 caliber)	Lead: Propellant: single-base (nitrocellulose) or double-base (nitrocellulose and nitroglycerin)
	Battery Murphy	6-inch armor piercing projectile MK 35	Steel (chromium, copper, iron, and nickel), Explosive D (Ammonium picrate)
		6-inch special common projectile MK 27	Steel (chromium, copper, iron, and nickel), Explosive D (Ammonium picrate)
		6-inch high explosive projectile MK II	Steel (chromium, copper, iron, and nickel), Explosive D (Ammonium picrate), TNT
		37 millimeter practice	Steel (chromium, copper, iron, and nickel), Propellant – flashless-nonhygroscopic powder (nitrocellulose, dibutylphthalate, dinitrotoluene, and diphenylamine)
	Battery Ord	8-inch armor piercing projectile MK 21	Steel (chromium, copper, iron, and nickel), Explosive D (Ammonium picrate)
	Battery Crenshaw	3-inch armor piercing projectile M 63	Steel (chromium, copper, iron, and nickel), Explosive D (Ammonium picrate)
		Small Arms (.30, .50 caliber)	Lead. Propellant: single-base (nitrocellulose) or double-base (nitrocellulose and nitroglycerin): Tracer composition: strontium nitrate, polyvinyl chloride, strontium peroxide, and magnesium powder.
	Columbia River Minefield	M4 Ground Mines	Steel (chromium, copper, iron, and nickel), TNT
		Buoyant mines	Steel (chromium, copper, iron, and nickel), TNT

Information provided on this table is from the Archives Search Report (USACE, 2003).
TNT – 2,4,6-trinitrotoluene.

Table 2
Rights of Entry Status
Fort Columbia Military Reservation

Parcel ¹	Landowner	Parcel ID	Date Signed by Landowner	Right of Entry Duration	Estimated Date to Contact Prior to Field Work
5, 8	State of Washington Parks and Recreation	09102100000	In process	9 months	1 week prior

¹ Parcel locations shown on Figure 5.

Table 3
Sample Location Rationale
Fort Columbia Military Reservation

Area of Concern	Sample Location	Sample Media	Sample Location Rationale
Small Arms Range	091A001	Surface soil	Contingency samples, to be collected only if small arms range is located during field reconnaissance. Samples to be collected from target area. Samples to be analyzed for lead only.
	091A002		
Background	091A003	Surface Soil	Three background surface soil samples will be collected if target area samples are collected at the Possible Small Arms Range.
	091A004		
	091A005		Sampling locations will be determined in the field based on visual observation that the area does not appear to be impacted by past site operations.

Table 4
Sample Designations, Quality Assurance/Quality Control, and Analyses
Fort Columbia Military Reservation

Area of Concern	Sample Location	Sample Type	Sample Number	Sample Media	Quality Assurance/Quality Control Samples		Analysis/U.S. Environmental Protection Agency (EPA) Method
					Field Duplicate	MS/MSD	
Small Arms Range	091A001	Composite	NWO-091-0001	Surface Soil			Lead by EPA SW-846 Method 6020A
	091A002	Composite	NWO-091-0002	Surface Soil	NWO-091-0003		
Background	091A003	Composite	NWO-091-5001	Surface Soil			Lead by EPA SW-846 Method 6020A
	091A004	Composite	NWO-091-5002	Surface Soil			
	091A005	Composite	NWO-091-5003	Surface Soil		NWO-091-003MS/MSD	

MS/MSD = matrix spike/matrix spike duplicate

Table 5
Human Health Soil and Sediment Screening Criteria and Selected Values for Munitions Constituents
Fort Columbia Military Reservation

Analyte	USEPA Region 6 ^a		USEPA Region 9 ^b		Washington Department of Ecology - Soil Cleanup Levels ^c					Final Screening Value ⁱ (mg/kg)
	Residential MSSLs (mg/kg)	Industrial Outdoor Worker MSSLs (mg/kg)	Residential PRGs (mg/kg)	Industrial PRGs (mg/kg)	Method B Level - Unrestricted ^d (mg/kg)	Leaching - Phase 3 Model - Unrestricted ^e (mg/kg)	Method B Level - Industrial ^f (mg/kg)	Leaching - Phase 3 Model - Industrial ^g (mg/kg)	Natural Background Level ^h (mg/kg)	
Metals										
Lead	400	800	400	800	NVA	3,000	NVA	3,000	24	400

Acronyms and Abbreviations:

CLARC = Cleanup Level and Risk Calculation

WAC = Washington Administrative Code

NVA = no value available

mg/kg = milligrams per kilogram

C = Value for carcinogen

N = Value for noncarcinogen

NA = not applicable, compound considered not present in natural soils

USEPA = U.S. Environmental Protection Agency

Notes:

^a Region 6 Medium-Specific Screening Level (MSSL) table; December 2007. Values are based on residential and industrial outdoor worker exposure to single chemicals.

^b Region 9 Preliminary Remediation Goals (PRG) table; October 2004. Values are based on residential and industrial exposure to single chemicals.

^c Cleanup levels are established under the Model Toxics Control Act (MCTA) Cleanup Regulation. Chapter 173-340 WAC.

^d Values from Notes on Method A Cleanup Levels WAC 173-340-720, 740, and 745, Table 740-1, Table 5: Method B Calculations for Carcinogens for Soil Ingestion Plus Dermal Contact and Table 6: Method B Calculation for Soil Ingestion Plus Dermal Contact. Based on Unrestricted land use. From CLARC Notes undated on November 23, 2004.

^e Values from Notes on Method A Cleanup Levels WAC 173-340-720, 740, and 745, Table 740-1, Table 7: 3-Phase Model Assumptions and Results. Based on protection of groundwater. From CLARC Notes updated on November 23, 2004.

^f Values from Notes on Method A Cleanup Levels WAC 173-340-720, 740, and 745, Table 745-1, Table 5: Method C Industrial Calculations for Carcinogens for Soil Ingestion Plus Dermal Contact and Table 6: Method C Industrial Calculations for Carcinogens for Soil Ingestion Plus Dermal Contact. Based on industrial land use. From CLARC Notes updated on November 23, 2004.

^g Values from Notes on Method A Cleanup Levels WAC 173-340-720, 740, and 745, Table 745-1, Table 7: 3-Phase Model Assumptions and Results. Based on protection of groundwater. From CLARC Notes updated on November 23, 2004.

^h Values from "Natural Background Soil Metals Concentrations in Washington State", Publication #94-115, October 1994. Based on data for Puget Sound.

ⁱ Final Screening Value selected based on the lowest value listed for chemical between USEPA Region 9 PRG and Washington Department of Ecology – Soil Cleanup Levels

Table 6
Ecological Soil Screening Criteria and Selected Values for Munitions Constituents
Fort Columbia Military Reservation

Analyte	Proposed Benchmarks										Potential Bioaccumulative Constituent? ^h	Final Proposed Ecological Screening Value Soil ⁱ (mg/kg)
	Washington Department of Ecology Lowest Value for Plants/ Soil Biota/Wildlife ^a (mg/kg)	USEPA Region 5 ESLs ^b (2003) (mg/kg)	USEPA Region 7 ^c (mg/kg)		USEPA Region 8 ^d (mg/kg)		USEPA Region 10 ^e (mg/kg)		Other Values: Talmage et al. (1999) ^f or LANL (2005) ^g (mg/kg)			
Metals												
Lead	50	0.0537	11	SSL	11	SSL	11	SSL	14	LANL	Yes	50

Acronyms and Abbreviations:

LANL = Los Alamos National Laboratory
mg/kg = milligrams per kilogram

SSL = USEPA Eco Soil Screening Levels
USEPA = U. S. Environmental Protection Agency

Notes:

^a Washington Department of Ecology, Toxics Cleanup Program, Table 749-3, Ecological Indicator Soil Concentrations for Protection of Terrestrial Plants and Animals. Developed under WAC 173-340-7493 (2)(a)(i).

^b Ecological Screening Levels (ESLs), USEPA Region V, August 2003

^c USEPA Region 7: Catherine Wooster-Brown (Eco Risk Assessor) recommends the following hierarchy: USEPA EcoSSLs; ORNL Efromson values; USEPA Region 4 values other published values.

^d USEPA Region 8: Dale Hoff (Eco Risk Assessor) recommends the following hierarchy: USEPA SSLs; Dutch Intervention Values or ORNL Efromson value;

^e USEPA Region 10: Joseph Goulet (Eco Risk Assessor) says Region 10 has no recommended hierarchy, therefore, values from the USEPA Region 7 Approach were used

^f Talmage, S.S., D.M. Opresko, C.J. Maxwell, C.J.E. Welsh, F.M. Cretella, P.H. Reno, and F.B. Daniel, 1999, Nitroaromatic Munition Compounds: Environmental Effects and Screening Values, Rev. Environ. Contam. Toxicol.

^g Los Alamos National Laboratory (LANL), Eco Risk Database, Release 2.2, September 2005

^h Potential bioaccumulative constituents will be evaluated in more detail, as some screening values do not take into account bioaccumulation

Potential bioaccumulative potential from: *Bioaccumulation and Interpretation for the Purposes of Sediment Quality Assessment: Status and Needs* (USEPA, 2000) and ODEQ EQSLVs (ODEQ, 2001).

ⁱ Final Screening Value selected using the following hierarchy

1. State Value (Washington)
2. USEPA Region State Located In (USEPA Region 10)
3. Lower of Talmage et al. (1999) or LANL (2005) values.

Other References:

U.S. Environmental Protection Agency, 2007, *Guidance for Developing Ecological Soil Screening Levels (Eco-SSLs)*, Office of Solid Waste and Emergency Response, Website version last updated November 28, 2007: <http://www.epa.gov/ecotox/ecossl>.

U.S. Environmental Protection Agency, 2001, *Supplemental Guidance to RAGS: Region 4 Bulletins, Ecological Risk Assessment*. Originally published November 1995. Website version last updated November 30, 2001: <http://www.epa.gov/region4/waste/ots/ecolbul.htm>.

Efromson, R.A., Suter II, G.W., Sample, B.E. and Jones, D.S., 1997. Preliminary Remediation Goals for Ecological Endpoints. Lockheed Martin Energy Systems, Inc. (ORNL) ES/ER/TM-162/R2.

Dutch Intervention Values:

Swartjes, F.A. 1999. *Risk-based Assessment of Soil and Groundwater Quality in the Netherlands: Standards and Remediation Urgency*. Risk Analysis 19(6): 1235-1249

The Netherlands Ministry of Housing, Spatial Planning and Environment's Circular on target values and intervention values for soil remediation

http://www2.minvrom.nl/Docs/internationaal/S_I2000.pdf and Annex A:

Target Values, Soil Remediation Intervention Values and Indicative Levels for Serious Contamination http://www2.minvrom.nl/Docs/internationaal/annexS_I2000.pdf were also consulted.

Appendix A
Conceptual Site Model

Conceptual Site Model – Fort Columbia Military Reservation

Overview

A site-specific conceptual site model (CSM) summarizes available site information and identifies relationships between exposure pathways and associated receptors. A CSM is used to determine the data types necessary to describe site conditions and quantify receptor exposure, and discusses the following information:

- Current site conditions and future land use.
- Potential munitions and explosives of concern (MEC) or munitions constituents (MC) sources (e.g., lead projectiles in an impact berm).
- Affected media.
- Governing fate and transport processes (e.g., surface water runoff and/or groundwater migration).
- Exposure media (i.e., media through which receptors could contact site-related MEC or MC).
- Routes of exposure (e.g., inhalation, incidental ingestion, and dermal contact).
- Potential human and/or representative ecological receptors at the exposure point. Receptors likely to be exposed to site MEC or MC are identified based on current and expected future land uses.

The CSM is evaluated for completeness and further developed as needed through Technical Project Planning meetings and additional investigation.

Background

This CSM includes the entire Fort Columbia site, including the three artillery batteries and river mining operations. Battery Ord, Battery Crenshaw, and Battery Murphy became operational in 1903. The third gun emplacement at Battery Ord was decommissioned in approximately 1910 as a result of severe flooding problems. The remaining two 8-inch guns were removed in 1918. Battery Crenshaw's three 3-inch rapid fire guns were removed from service in 1921. Battery Murphy was operational through World War II (U.S. Army Corps of Engineers [USACE], 2003).

History of Use

Construction on the three batteries was completed around 1900 and Fort Columbia was manned in 1903. Battery Ord was fitted with three 8-inch guns, Battery Crenshaw with three 3-inch rapid-fire guns, and Battery Murphy with two 6-inch guns.

The third gun emplacement at Battery Ord was decommissioned in about 1910 as a result of severe flooding problems. The remaining two guns were removed in 1918. Battery Crenshaw was removed from service in 1921. Only Battery Murphy remained in service through World War II.

During World War I, a new mine casemate building was constructed to support mining operations of the Columbia River. During the World War I time period only buoyant mines were used.

Following World War I, Battery Murphy and Fort Columbia were put in caretaker status. In 1940 they were taken off of caretaker status. In the 1940s, the mine casemate building was modernized constructed to provide higher survivability in case of attack and to support upgraded mining operations. Activities at Battery Murphy and Fort Columbia ended in 1944 when the threat from attack by the Japanese was considered low.

There is no documentation of the artillery guns being fired. However, test firing most certainly occurred, likely with solid projectiles. Interviews with former army personnel stationed at Fort Columbia confirmed that practice firing with solid projectile shells was conducted and that no high explosive rounds were fired during training.

The artillery guns fired out over the Columbia River, protecting the river and the minefield in the river. The range fan is over the Columbia River.

The date that river mining began is not known. However, it is known that the river was mined during both World War I and II. The minefield during World War II consisted of M4 ground mines which replaced the buoyant mines. Mine locations used in 1944 are shown in Appendix E-8 of the ASR (USACE, 2003) and on Figure 2 of the Site-Specific Work Plan (SSWP). The minefield was removed following World War II, but it is not known if any mines may have been lost from the minefield due to heavy current or storms.

In 1947, the War Department declared the site surplus and ownership was transferred to the War Assets Administration. In 1951, the property was transferred to the state of Washington for use as a state park.

Munitions and Associated MC

Munitions used at Battery Murphy, as well as other batteries that were dismantled prior or during World War I, are listed on Table 1 of the SSWP. MC associated with these munitions are also listed.

Previous MEC Finds

No previous MEC finds at Fort Columbia have been documented. However, an historian interviewed in 2003 for the ASR (USACE, 2003) reported that an empty buoyant mine was recovered at the mouth of the Columbia River in about 1993.

Previous MC Sample Results

There have been no previous investigations for MC at Fort Columbia.

Current and Future Land Use

The current use and anticipated future use will remain as a state park. With unlimited access to all areas.

Ecological Receptors

The Columbia River supports a wide range of wildlife including threatened and endangered species. The Columbia River is designated as critical habitat for the federally-threatened Chinook and Chum salmon and Steelhead (NOAA, 2005) and therefore, qualifies as an Important Environmental Place (IEP).

MEC Evaluation

The primary weapons used at Fort Columbia include large caliber artillery (3-inch to 8-inch) guns, 37 millimeter guns, buoyant and non-buoyant mines, and small arms. The batteries were used to protect the Columbia River and associated minefields.

There is no known MEC present at Fort Columbia. Munitions used or stored during operation of Fort Columbia include high explosive armor piercing shells and practice shells listed on Table 1 of the SSWP.

No MEC has been found at Fort Columbia. However, an historian interviewed in 2003 for the ASR (USACE, 2003) reported an empty buoyant mine was recovered at the mouth of the Columbia River in about 1993. If MEC were present, it would likely be subsurface at the bottom of the Columbia River.

Two possible small arms ranges have been identified at Fort Columbia. One is likely underwater in the Columbia River and the second is reported to be located near the park entrance on the north side of Highway 101.

The property is no longer owned or used by the Department of Defense (DoD) and is currently owned by the state of Washington and is used as a state park. Site buildings have been partially restored.

The population density near Fort Columbia is less than 100 persons per square mile. There is no barrier preventing public access to the site.

MC Pathway Evaluation

Overview of Site Characteristics

All artillery munitions were fired from heavily constructed concrete bunkers located on the bluffs overlooking the Columbia River. Buoyant mines and ground mines were positioned out in

the Columbia River with strong currents. A small arms range may be present near the park entrance on the north side of Highway 101.

The Columbia River is located adjacent to Fort Columbia. Groundwater is assumed to flow towards the Columbia River. There is no groundwater use between the firing points and the river.

Terrestrial Pathway

Sources of MC

MC consists of lead from small arms use and explosives from artillery firing including ammonium picrate, trinitrotoluene, and flashless-nonhygroscopic powder (nitrocellulose, dibutylphthalate, dinitrotoluene, and diphenylamine). No perchlorate containing MC has been identified. Table 1 of the SSWP identifies steel and its components (chromium, copper, iron, and nickel) as potential MC. However, this MC is for the projectile only and all artillery targets and impact areas were in the river and metals are not MC for the terrestrial pathway.

All artillery firing was done at artillery gun batteries. Potential explosive residue collection areas are immediately in front of the batteries. While explosives have been found in front of the muzzles at active sites, it is much less likely at Fort Columbia because of the infrequent firing and age (greater than 60 years). It was agreed at the TPP meeting that sampling for explosives in front of the batteries would not be conducted. All firing was done out into the river and impact areas and safety fans are within the river.

There has been no previous MC sampling.

The date that river mining began is not known. However, it is known that the river was mined during both World War I and II. Following World War II all mines were removed from the river, but mines placed in the Columbia River channel may have been lost in the river due to heavy current or storms. It is unlikely that any mines remain in the river because of the time elapsed and river flow. MC in the mines includes steel (chromium, copper, iron, and nickel) and trinitrotoluene.

Migration Pathway

The migration pathway for MC located in soils directly in front of the battery and at the possible small arms range via ingestion by humans, wildlife, and plants.

The ASR (USACE, 2003) described some bank erosion into the Columbia River. No other land disturbance is known to have occurred since DoD use.

Land Use and Access

Current and future land use will remain as a state park and the Columbia River will continue to be used for shipping and recreational use.

Human Receptors

Potential human receptors are park workers and visitors. The pathway is through the ingestion of soil. The pathway for explosives at the batteries is considered incomplete due to the following reasons:

- Guns were fired infrequently for target practice only. Thus limiting the quantity of potential explosives residue.
- It has been greater than 60 years since the last firing of the guns.
- Degradation of explosive compound residues.

The pathway for the potential small arms range is potentially complete.

Ecological Assessment

Because of the presence of a state park, sensitive wetlands, and critical habitat in the adjacent Columbia River, Fort Columbia is considered an IEP. Documented bald eagle nesting sites are located on the FUDS property. The Columbia River supports a wide range of wildlife including threatened and endangered species.

The terrestrial ecological pathway is considered potentially complete if MC is found above screening levels.

Surface Water Pathway

Sources of MC

Sources of MC are the soils located directly in front of the batteries, artillery shells fired into the Columbia River, mines placed in the river, and lead from small arms firing.

MC consists of metals (chromium, copper, iron, lead, and nickel) from projectiles and mines and explosives from mines.

Migration Pathway

Migration pathway to humans and ecological receptors is through consumption and contact with Columbia River water downstream of the FUDS. However, because of the high river flow rates (265,000 cubic feet per second), any impacts to the river would be rapidly diluted. Runoff from the small arms range is considered to be an incomplete migration pathway. Lead has a very low solubility in water and contact time with lead-impacted soils would be very short. Therefore, runoff would not be impacted from lead.

Surface Water Use and Access

The Columbia River is used for shipping, fisheries, and recreational uses. All activities occur within the footprint of the range fan.

Human Receptors

Human receptors could be exposed to MC through the ingestion of aquatic foods (fish or clams) and through contact with river water.

The pathway is considered incomplete because of the small amount of potential MC released to the river and the dilution that occurs from river flow volume.

Ecological Assessment

The Columbia River is considered an IEP because of the presence of threatened and endangered species present in the river and critical habitat in the Columbia River. The list of threatened and endangered species will be updated as indicated in Section 2.4.3 of the SSWP.

The pathway is considered incomplete because of the small amount of potential MC released to the river and the dilution that occurs from river flow volume.

Groundwater Pathway

Sources of MC

Sources of MC for groundwater are from soils located directly in front of the batteries.

Migration Pathway

The potential for MC to be leached to groundwater from rainfall exists. Depth to groundwater is expected to be between approximately 10 ft to 100 ft, or equal to the elevation of the batteries above river level.

There are no downgradient pathways as the batteries are located within a few hundred feet of the river shore.

Groundwater Use and Access

There are no downgradient users of groundwater because of the proximity of the firing points to the river.

Human Receptors

There are no human receptors because of the proximity of the firing points to the river. The human health pathway is considered incomplete.

Air Pathway

Sources of MC

Sources of MC in soil are in front of the batteries.

Migration Pathway

There is very low potential for airborne exposure to MC. The soils are vegetated either with grass or heavy underbrush.

Human Receptors

Human receptors would be park workers and visitors. Because of to the vegetation covering the soil, the air pathway is considered incomplete.

CSM Summary/Data Gaps

Evaluation of the CSM indicates the following known conditions or data gaps:

CSM Section	Known	Unknown	Notes
MEC		X	No MEC has been found at the site
Terrestrial pathway – human receptors	X	X	Incomplete pathway for batteries, unknown for small arms range
Terrestrial pathway – ecological receptors		X	MC not expected to be present because of age of last use; no sampling
Surface water pathway – human receptors	X		Incomplete pathway
Surface water pathway – ecological receptors	X		Incomplete pathway
Groundwater pathway	X		Incomplete pathway
Air pathway	X		Incomplete pathway

Appendix B
USACE Interim Guidance Document 06-05
and Safety Advisory 06-2



REPLY TO
ATTENTION OF:

DEPARTMENT OF THE ARMY
HUNTSVILLE CENTER, CORPS OF ENGINEERS
P.O. BOX 1600
HUNTSVILLE, ALABAMA 35807-4301

MAR 16 2006

CEHNC-OE-CX

MEMORANDUM FOR SEE DISTRIBUTION

SUBJECT: Procedure for Preliminary Assessment (PA) and Site Inspection (SI) Teams that Encounter Unexploded Ordnance (UXO) While Gathering Non-UXO Field Data, Military Munitions Center of Expertise (MM CX) Interim Guidance Document (IGD) 06-05

1. PURPOSE: This procedure describes the responsibilities of project teams during the preliminary assessment and site investigation phases should unexploded ordnance (UXO) be discovered.
2. APPLICABILITY: This guidance is applicable to the geographic military Districts, Military Munitions Response Program (MMRP) Design Centers, Major Subordinate Commands (MSCs), and designated Remedial Action Districts performing MMRP response actions.
3. REQUIREMENTS AND PROCEDURES:
 - a. During site visits to formerly used defense site (FUDS) properties to gather PA or SI information, in the rare instance that a UXO-qualified individual identifies an item that is an explosive hazard, the following actions will occur:
 - (1) The property owner or individual granting rights of entry to the property will be notified of the hazard and advised to call the local emergency response authority (i.e., police, sheriff, or fire department). The individual will also be informed that if they do not call the local response authority within 1 hour, the individual who identified the UXO item will notify the local emergency response authority.
 - (2) The local response authority will decide how to respond to the reported incident, including deciding not to respond (e.g., if the local response authority is already aware of the hazards on the property). If the local response authority decides to respond, the individual who identified the item or his designee will mark the location of the item and provide accurate location information to the emergency response authority. The individual who identified the item or his designee will generally remain in the area until the local response authority arrives, unless specifically indicated by the appropriate response authority that the individual may leave the area.
 - (3) During the SI, the state regulator may also be notified at their request.

MAR 16 2006

CEHNC-OE-CX

SUBJECT: Procedure for Preliminary Assessment (PA) and Site Inspection (SI) Teams that Encounter Unexploded Ordnance (UXO) While Gathering Non-UXO Field Data, Military Munitions Center of Expertise (MM CX) Interim Guidance Document (IGD) 06-05

b. During site visits to active installations or Base Realignment and Closure (BRAC) sites to gather PA or SI information, in the rare instance that a UXO-qualified individual identifies an item that is an explosive hazard, the following actions will occur:

(1) The installation point of contact (POC) or the BRAC coordinator will be notified of the hazard and requested to notify explosive ordnance disposal (EOD) through their channels.

(2) The installation/EOD will make the determination if they are going to respond to the incident. The installation/EOD may be aware of the hazards at the site and make the decision not to respond. If the installation/EOD decides to respond, the individual who identified the item or his designee will mark the location and provide accurate location information to the installation/EOD unit and will remain in the area unless the installation/EOD unit requests otherwise.

c. Neither the US Army Corps of Engineers personnel, nor their contractors have the authority to call EOD to respond to an explosive hazard. This call is the responsibility of the local emergency response authority for FUDS properties and it must come through the proper chain of command on installations.

d. AR 75-14 and AR 75-15 contain the information on how EOD responds to explosives hazards.

4. EFFECTIVE DATES: The requirements and procedures set forth in this interim guidance are effective immediately. They will remain in effect indefinitely, unless superseded by other policy or regulation.

5. POINT OF CONTACT: If you need additional information, please contact Mr. Brad McCowan at 256-895-1174.



CAROL A. YOUKEY, P.E.
Chief, Center of Expertise for Ordnance
and Explosives Directorate



DEPARTMENT OF THE ARMY
HUNTSVILLE CENTER, CORPS OF ENGINEERS
P.O. BOX 1600
HUNTSVILLE, ALABAMA 35807-4301
May 23, 2006

REPLY TO
ATTENTION OF:

OE Safety Division for Ordnance
and Explosives Directorate

Shaw Environmental
4171 Essen Lane
Baton Rouge, Louisiana 70809

Dear Sir/Madam:

This is Safety Advisory 06-2 – Munitions and Explosives of Concern (MEC) Safety During Site Inspections (SI), Pre-Work Plan Visits, Archive Search Reports (ASR) Investigations and Other Site Visits of a Non-Intrusive Nature.

Reference EP 75-1-1, EP 385-1-95a, and Interim Guidance Document (IGD), March 15, 2006.

The following procedures will be followed if an item is found that has an explosive hazard during the activities identified in the subject line:

- a. MEC items are not to be moved or disturbed during the above subject SI, Pre-Work Plan visits, ASR Investigations and other site visits of a non-intrusive nature.
- b. The locations of any discovered explosive hazardous items should be marked for accurate relocating purposes and the information provided to the designated Point of Contact (POC) and any emergency response authorities as may be required.
- c. During site visits to active Installations and/or Base Realignment and Closure (BRAC) sites the identified Installation POC or the BRAC coordinator should be notified of discovered MEC hazards. They then will request any appropriate emergency response action as deemed necessary through their channels if required.
- d. When a site visit is on a Formerly Utilized Defense Site, the property owner shall be notified in the event of finding any found explosive hazards along with the location of the explosive item(s) found, the property owner should then in turn notify their local emergency response authorities.

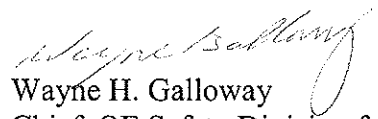
e. During these site visits all required MEC security requirements should be implemented as necessary and required. All team members are to be instructed in and made aware of any MEC security requirements.

f. All team members will be briefed on these procedures prior to any site investigations being performed and daily before any work begins.

This Safety Advisory is intended to serve as an explosives safety reminder.

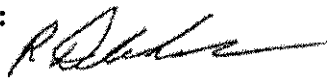



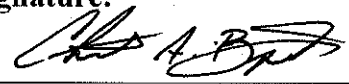
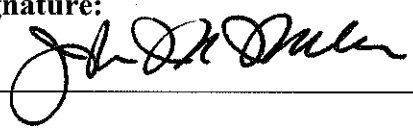
Comments or questions about this Safety Advisory can be directed to the undersigned at (256) 895-1598/82.

Sincerely,



Wayne H. Galloway
Chief, OE Safety Division for
Ordnance and Explosives Directorate

Appendix C
Site Safety and Health Plan Addendum

ADDENDUM WA-3 TO SITE SAFETY AND HEALTH PLAN (SSHP) REVIEWS AND APPROVAL US Army Corps of Engineers, Omaha District		This SSHP is a part of the Omaha District Safety Program. Please read and comply with USACE EM 385-1-1 and CENWO OM 385-1-1.
Reviewer	Date	Signatures
Authored by: Dale Landon	5/1/08	Signature: 
Peer Review by: Dave Mummert CIH	5/7/08	Signature: 
Quality Control Review (QCR) by: Daniel McKellin	5/19/08	Signature: 
Project Manager Reviewed by: Peter Kelsall	5/19/08	Signature: 
USACE Omaha District MM DC OE Safety Specialist Review: Chris Bryant	7/16/08	Signature: 
USACE Omaha District MM DC Project Manager Approval: John Miller	7/18/08	Signature: 

<p>ADDENDUM <u>WA-3</u> TO SITE SAFETY AND HEALTH PLAN (SSHP) TITLE PAGE US Army Corps of Engineers, Omaha District</p>	<p>This SSHP is a part of the Omaha District Safety Program. Please read and comply with USACE EM 385-1-1 and CENWO OM 385-1-1.</p>
<p>PROJECT NAME: FUDS SI – Fort Columbia Military Reservation</p>	
<p>PURPOSE OF ADDENDUM:</p> <p>This Addendum provides details specific to activities at this FUDS that were not provided in the approved Accident Prevention Plan and Site Safety and Health Plan included in the <i>Final Type I Work Plan, Site Inspections at Multiple Sites, NWO Region</i> (Shaw, 2006).</p>	
<p>DESCRIBE THE CHANGES EFFECTED BY THIS ADDENDUM:</p> <p>Site-specific supplemental information noted in following text.</p>	

SITE SAFETY AND HEALTH PLAN ADDENDUM

Site Name:	Fort Columbia Military Reservation
Site Location:	The former Fort Columbia Military Reservation is located approximately 2 miles from Chinook, Washington and 7 miles from Ilwaco, Washington, in Pacific County. The area of concern is a coastal artillery battery and potential small arms range.
Purpose of Visit:	Site Inspection to conduct site reconnaissance for munitions and explosive of concern (MEC) and to potentially collect soil samples to evaluate the presence of lead.
Date(s) of Site Visit:	July 2008
Office:	Shaw Environmental, Inc., Denver, Colorado office
Address:	7604 Technology Way, Suite 300 Denver, CO 80237
Telephone:	720-554-8178

Date Prepared: May 1, 2008

Site inspection work at this Formerly Used Defense Sites (FUDS) will be conducted in accordance with the approved Accident Prevention Plan and Site Safety and Health Plan (SSHP) included in the *Final Type I Work Plan, Site Inspections at Multiple Sites, NWO Region* (Work Plan; Shaw Environmental, Inc. [Shaw], 2006). This Addendum provides details specific to activities at this FUDS that were not provided in the SSHP.

I. SITE DESCRIPTION AND PREVIOUS INVESTIGATIONS

(A site map is provided in the Site-Specific Work Plan.)

A. SITE DESCRIPTION:

- Size: One Area of Concern covering approximately 770 acres of dry land surface and 5,841 acres over land and water.
- Present Usage (Check all that apply)

<input type="checkbox"/> Military	<input checked="" type="checkbox"/> Recreational	<input type="checkbox"/> Agricultural (primary use)
<input type="checkbox"/> Residential	<input type="checkbox"/> Commercial	<input type="checkbox"/> Landfill
<input checked="" type="checkbox"/> Natural Area	<input type="checkbox"/> Industrial	
<input checked="" type="checkbox"/> Other Specify State Historical Park		

<input type="checkbox"/> Secured	<input type="checkbox"/> Active	<input type="checkbox"/> Unknown
<input checked="" type="checkbox"/> Unsecured	<input checked="" type="checkbox"/> Inactive	

B. PAST USES:

Fort Columbia was purchased in 1864 from an early pioneer for use as a coastal defense site. The land was undisturbed until 1898 when concerns for coastal security resulting from the Spanish-American War renewed interest in construction of a modern seacoast defense system. At that time three batteries, Battery Ord, Battery Crenshaw, and Battery Murphy, and a mine casemate were constructed and completed by 1900. The first contingent of Army regulars reported to the garrison in June 1903.

Fort Columbia provided a coastal defense system for the Columbia River in conjunction with Fort Canby and Fort Stevens through the end of World War II. After 1921, Battery Murphy was the only operational battery. None of the artillery was ever fired at the enemy.

Following World War I, Fort Columbia along with Fort Stevens and Fort Canby were placed in caretaker status. In the summer of 1940, all operable gun batteries at the three coastal defense sites were activated. Shortly after the start of World War II, buoyant mines were laid across the mouth of the Columbia River, which were soon replaced by M4 ground mines in early 1942. In 1941 and 1945, the mine casemate building was upgraded to provide higher survivability in case of attack and to support upgraded river mining operations.

Fort Columbia was manned for battle until the end of 1944 when it became apparent that Japan was no longer a threat to the coast. At that time the manning of the fort was decreased and the 6-inch guns removed and shipped out. The minefield was removed from the river and war material was shipped back to depots for redistribution. Fort Columbia reverted to caretaker status and awaited disposition.

In 1947, the Department of the Army declared Fort Columbia as surplus and in 1948 conveyed the property to the War Assets Administration for eventual disposal. In 1951 the War Assets Administration granted the state of Washington the property and that

same year the state opened the Fort Columbia State Park. The site has remained a state park ever since.

C. SURROUNDING POPULATION:

<input checked="" type="checkbox"/> Rural	<input type="checkbox"/> Residential	<input type="checkbox"/> Commercial
<input type="checkbox"/> Urban	<input type="checkbox"/> Industrial	
<input checked="" type="checkbox"/> Other Specify State Park		

D. PREVIOUS SAMPLING/INVESTIGATION RESULTS:

An Inventory Project Report (INPR) was completed for Fort Columbia in 1992. The INPR identified that Fort Columbia was formerly used by the U.S. Department of Defense. The INPR identified that there were seven storage tanks on the site that had been unused since the Army vacated the property. An independent removal action was completed in November and December 1993 (U.S. Army Corps of Engineers [USACE], 1996).

The USACE Rock Island District completed an Archives Search Report (ASR) in December 2003 (USACE, 2003). The ASR included a records search and site visit. The ASR indicated that the only known munitions used at Fort Columbia were shells related to the artillery batteries and mines used for mining the mouth of the Columbia River. There have been no reports of MEC at Fort Columbia. However, an historian interviewed in 2003 for the ASR reported at an empty buoyant mine was recovered at the mouth of the Columbia River in about 1993.

In 2004, the USACE completed an *INPR Supplement*, which identified Battery Murphy as the only range at Fort Columbia (USACE, 2004). An area of 5,841 acres was assigned to the range with the majority of the range over the Columbia River. The range was ranked according to the Risk Assessment Code procedure to address explosives safety hazards. The range received a Risk Assessment Code score of 5.

(1) MEC ENCOUNTERED: MEC has not be observed on the range.

(2) SAMPLES: None collected.

Chemical	Concentration	Media	Location
None.	None.	None.	None.

II. DESCRIPTION OF ON-SITE ACTIVITIES

<input checked="" type="checkbox"/> Walk Through	<input type="checkbox"/> Drive Through	<input type="checkbox"/> Fly Over
<input checked="" type="checkbox"/> On-Road	<input checked="" type="checkbox"/> Off-Road	<input checked="" type="checkbox"/> On-Path
<input checked="" type="checkbox"/> Off-Path		
<input type="checkbox"/> Other Specify		

Activities/Tasks to be Performed

Reconnaissance

A visual reconnaissance of the former coastal battery area of concern will be conducted to identify evidence of MEC and/or range activities (presence of MEC or munitions debris). Suspect areas of interest, as indicated in the Site-Specific Work Plan, will be inspected as part of the field reconnaissance. The reconnaissance team will locate, identify, and stake sampling locations within these areas. The density and type of MEC or munitions debris observed on the ground will be noted.

The following conditions at each planned sampling location will be documented or recorded in the field log book and/or by digital photographs:

- Presence or absence of MEC, shell casings, bullets, or debris,
- Coordinates of staked sampling locations (using a hand-held global positioning system unit),
- Access limitations,
- Vegetative cover,
- Soil conditions, and
- Other conditions encountered that impact sample collection.

The site reconnaissance will be performed by conducting a visual and geophysical inspection of the range. The geophysical inspection will be accomplished using an all-metals detector by the unexploded ordnance (UXO) technician. The path walked during the visual reconnaissance will be recorded using a hand-held global positioning system unit. Reconnaissance will not include detailed mapping. Touching or handling of MEC or munitions debris will not be allowed.

Soil Sampling

Two contingency soil samples may be collected from the area of the reported small arms range. The samples will only be collected if the small arms range is located. If the two contingency samples are collected, three background soil samples will also be collected.

The exact location of all soil samples will be determined during the site investigation based on the visual identification of the small arms range target area.

III. SITE PERSONNEL AND RESPONSIBILITIES

Name/Responsibility	Training					
	HAZWOPER 40-hour	8-hour HAZWOPER Refresher	Hazardous Waste Site Supervisor	First Aid	Cardiopulmonary Resuscitation	UXO Specialist
Dale Landon Field Team Leader/ Site Safety and Health Officer (SSHO)	X	X	X	X	X	
UXO Technician David Watkins (1420), Rob Irons (1137), Jim Bayne (1212), Rueben Rhodes (0169), Ron Stanfield (1161), or Dave Van Deman (1057)	X	X		X	X	X

IV. HAZARD ANALYSIS

A. Safety and Health Hazards Anticipated:

<input checked="" type="checkbox"/> Heat Stress	<input checked="" type="checkbox"/> Cold Stress	<input checked="" type="checkbox"/> Tripping Hazard
<input type="checkbox"/> Noise	<input type="checkbox"/> Electrical	<input type="checkbox"/> Falling Objects
<input checked="" type="checkbox"/> Foot Hazard	<input checked="" type="checkbox"/> Biological	<input type="checkbox"/> Overhead Hazard
<input type="checkbox"/> Radiological	<input type="checkbox"/> Confined Space	<input type="checkbox"/> Water
<input checked="" type="checkbox"/> Explosive	<input type="checkbox"/> Climbing	<input type="checkbox"/> Flammable
<input type="checkbox"/> Other Specify		

B. Overall Hazard Evaluation:

<input type="checkbox"/> High	<input type="checkbox"/> Moderate	<input checked="" type="checkbox"/> Low	<input type="checkbox"/> Unknown
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JUSTIFICATION:

Historical documentation indicates that no MEC or munitions debris have been identified at Fort Columbia. The FUDS was only used as a coastal artillery battery. All artillery firing was done over the Columbia River. No activities will occur at or near the river.

V. SITE INSTRUCTIONS FOR MEC AVOIDANCE

See Section 4.3 of the SSHP for full scope of MEC avoidance requirements.

- DO NOT touch or move any ordnance items regardless of the marking or apparent condition.
- DO NOT visit an ordnance site if an electrical storm is occurring or approaching. If a storm approaches during a site visit, leave the site immediately and seek shelter.
- DO NOT use radio or cellular telephones in the vicinity of suspect ordnance items.
- DO NOT walk across an area where the ground cannot be seen. If dead vegetation or dead animals are observed, leave the area immediately due to potential chemical agent contamination.
- DO NOT drive vehicles into suspected MEC areas; use clearly marked lanes.
- DO NOT carry matches, lighted cigarettes, lighters, or other flame producing devices into a MEC site.
- DO NOT rely on color codes for positive identification of ordnance items or their contents.
- Only the on-site UXO Specialist is allowed to approach suspected ordnance items to take photographs, and prepare a full description (take notes of the markings or any other identifiers/features).
- The location of any ordnance items found during the site investigation should be clearly marked so it can be easily located and avoided.
- Always assume ordnance items contain a live charge until it can be determined otherwise.

Section 4.3 of the SSHP defines on-site MEC avoidance requirements for FUDS properties. In general, the purpose of MEC or anomaly avoidance during SI activities is to avoid any potential surface or subsurface anomalies. Intrusive anomaly investigation is not authorized during MEC avoidance operations. The reconnaissance and sampling field work shall include a minimum of

two people, one of whom shall be a UXO technician. This team will be on site during all sampling activities. Sampling personnel must be escorted at all times in areas potentially containing MEC until the UXO team has completed the access surveys and the cleared areas are marked. If anomalies or MEC are detected, the UXO team will halt escorted personnel in place, select a course around the item, and instruct escorted personnel to follow. If MEC is encountered, Shaw will stop work in the vicinity and make notifications as outlined in the Work Plan (Shaw, 2006). Shaw is not to conduct further investigation or removal of any MEC.

VI. SITE CONTROL AND COMMUNICATIONS

A. SITE WORK ZONES: UXO avoidance will be conducted in accordance with the SHSP and USACE EP 75-1-2 during all SI activities. Rigid demarcation of work zones, for example, using barricades or caution tape, will generally not be required for this project. The Field Team Leader/SSHO, in consultation with the UXO Technician, will determine the boundary of an Exclusion Zone (EZ) to be established around a specific area of activity, appropriate to the potential hazards. The boundaries may be described by physical features, for example, fences, tree lines, or topographic features, or may be defined by a radius around the center of activity. The EZ boundary will be verbally communicated to team members, who will maintain a watch to assure that only field team members are within the work zone. If a bystander or intruder approaches the EZ, the field team will cease work and ask the person to remain outside the area. A Contamination Reduction Zone (CRZ) will generally not be required because personnel decontamination is not anticipated. If required, a CRZ will be established in a manner similar to that described for the EZ. The support zone will consist of all portions of the site not defined as an EZ or CRZ.

B. COMMUNICATIONS:

(1) ON SITE: Verbal communications will be used among team members to communicate to each other on site. If this communication is not possible, the following hand signals will be used.

GRIP PARTNER'S WRIST OR BOTH HANDS AROUND WAIST – Leave the area immediately.

HAND GRIPPING NOSE – Unusual smell detected.

THUMBS UP – OK, I am alright or I understand.

THUMBS DOWN – No, negative.

(2) OFF SITE: Off-site communications will be established at the site and may include an on-site cellular telephone or the nearest public telephone or private telephone that may be readily accessed.

☒ Cellular Phone: (509) 521-1437

☐ Public/Private phone

TELEPHONE NUMBERS:	
1. MEDICAL FACILITY (Emergency Care): Ocean Beach Hospital, Ilwaco, WA	(360) 642-3181
2. MEDICAL FACILITY (Non-Emergency Care): Convenient Care, Portland OR	(503) 666-6717
3. FIRE DEPARTMENT: Pacific County Fire Department # 2, Chinook, WA	911
4. SHERIFF'S DEPARTMENT: Pacific County Sheriff's Department	(360) 642-9397 or 911
5. POISON CONTROL CENTER:	(800) 222-1222
6. USACE MM DC PROJECT MANAGER: John Miller	(402) 995-2735 (office) (402) 350-3735 (cell)
7. USACE DISTRICT PROJECT MANAGER: Mike Nelson	(206) 764-3458 (office) (206) 390-9873 (cell)
8. USACE OE Safety: Chris Bryant	(402) 995-2279 (office) (402) 917-7476 (cell)
9. SHAW PROJECT MANAGER: Peter Kelsall	(720) 554-8178 (office) (303) 981-8435 (cell)
10. SHAW TECHNICAL LEAD: Dale Landon	(509) 946-2069 (office) (509)-521-1437 (cell)
11. SHAW FIELD LEADER: Dale Landon	(509) 946-2069 (office) (509)-521-1437 (cell)
12. SHAW SAMPLER: Dale Landon	509) 946-2069 (office) (509)-521-1437 (cell)
13. SHAW OE SAFETY: Brian Hamilton	(303) 690-3117 (office) (303) 809-0416 (cell)
14. SHAW UXO TECHNICIANS: David Watkins (1420), Rob Irons (1137), Jim Bayne (1212), Rueben Rhodes (0169), Ron Stanfield (1161), or Dave Van Deman (1057) (Contact: Morey Engle)	(303) 690-3870 (720) 480-3204 (cell)
15. Shaw Helpdesk	(866) 299-3445
16. Shaw Health and Safety Manager David Mummert	(419) 425-6129 (office) (419) 348-1544 (cell)

(3) EMERGENCY SIGNALS: In the case of small groups, a verbal signal for emergencies shall suffice. The emergency signal for large groups should be incorporated at the discretion of the UXO Technician.

☒ Verbal ☐ Nonverbal (Specify)

VII. EMERGENCY RESPONSE

(1) ACCIDENTS: Safety-related incidents and accidents will be immediately reported to the Shaw Project Manager, Shaw Health and Safety Manager, Shaw Helpdesk (if necessary), and the USACE Military Munitions Design Center (MM DC) Project Manager. Additional notifications within the USACE organization will be coordinated by the USACE MM DC Project Manager. Additional accident reporting responsibilities of Shaw personnel are described in Section 1.9 of the Accident Prevention Plan (Shaw, 2006).

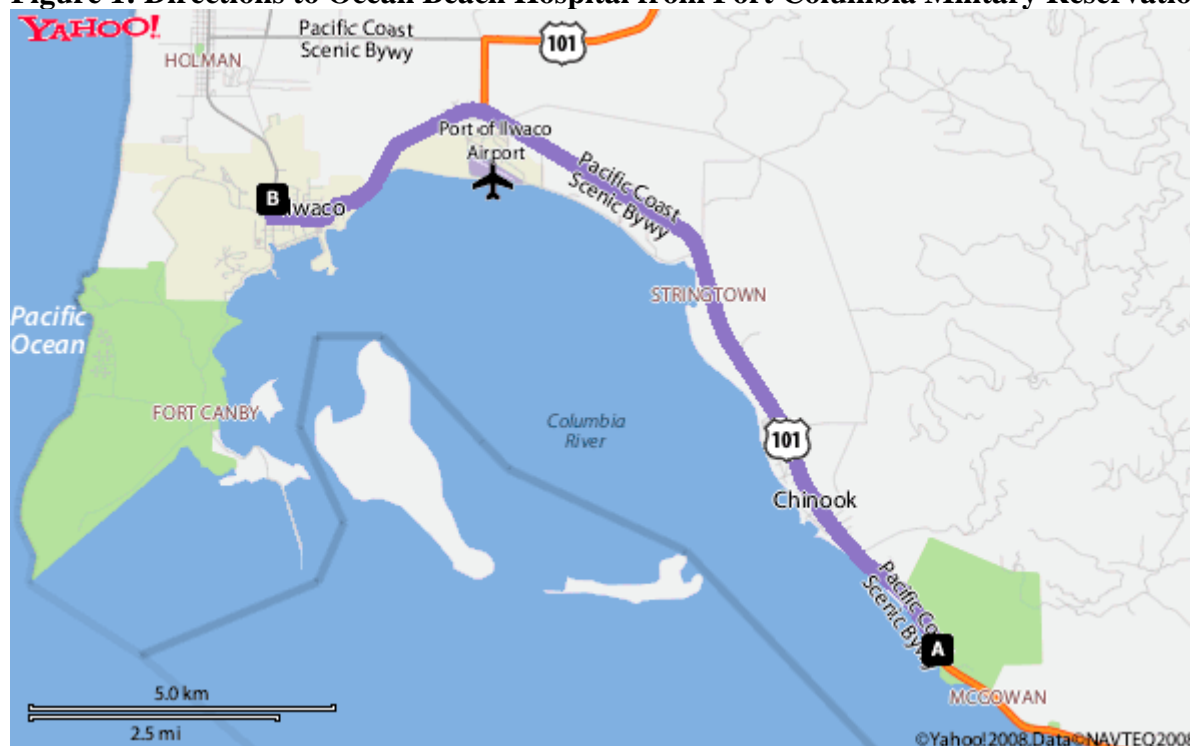
(2) DIRECTIONS TO THE NEAREST HOSPITAL/MEDICAL FACILITY:

Emergency medical care is available at Ocean Beach Hospital, 174 First Ave. N., Ilwaco, Washington.

Directions to Ocean Beach Hospital from Fort Columbia State Park, WA (see Figure 1):

- From Fort Columbia, take Pacific Coast Scenic Byway north for 1.5 miles.
- Continue on Hwy 101 (US-101) for 0.1 miles.
- Continue to follow US-101 for 6.8 miles.
- Turn right on First Ave. N. (US-101) for 0.2 miles.
- Arrive at 174 First Ave. N.

Figure 1: Directions to Ocean Beach Hospital from Fort Columbia Military Reservation



(3) CLINIC FOR NON-EMERGENCY MEDICAL TREATMENT

In the event of a work-related, nonlife threatening injury, the following occupational health clinic is approved by Health Resources for medical treatment of Shaw employees. Notifications per section VII. (1), above, and to Health Resources (800-350-4511) are required prior to transporting the employee to the clinic.

Convenient Care, 18750 Stark Street, Portland, OR 97233 (503-666-6717).

Directions from Fort Columbia to Convenient Care in Portland Oregon:

A

FORT COLUMBIA STATE PARK, MCGOWAN, WA 98638

1. Starting at FORT COLUMBIA STATE PARK on PACIFIC COAST SCENIC BYWAY

go 0.6 mi

2. Continue on US-101

go 2.1 mi

3. Turn **R** on US-101

go 4.3 mi

4. Turn **L** on US-30

go 0.9 mi

5. Turn **R** on 7TH ST

go 0.1 mi

6. Turn **L** on COMMERCIAL ST

go 0.5 mi

7. Continue on US-30

go 46.1 mi

8. Take ramp onto LEWIS AND CLARK BRG toward LONGVIEW/SEATTLE

go 1 mi

9. Continue on WA-433

go 1.8 mi

10. Turn **R** on TENNANT WAY(WA-432 E)

go 3.2 mi

11. Take ramp onto I-5 S

go 29.2 mi

12. Take exit #7/SALEM (WA-14)

go 0.6 mi

13. Continue on I-205 S

go 14.2 mi

14. Take exit #22/THE DALLES onto I-84 E

go 4 mi

15. Take exit #13/181ST AVE./GRESHAM

go 0.3 mi

16. Turn **R** on NE 181ST AVE

go 1.3 mi

17. Turn **L** on E BURNSIDE ST

go 0.5 mi

18. Make a Sharp **R** Turn on SE STARK ST

go 0.1 mi

19. Arrive at 18750 SE STARK ST, PORTLAND, on the **L**

go < 0.1 mi

B

18750 SE STARK ST, PORTLAND, OR 97233-5330

Distance: 110.7 miles, Time: 2 hours 15 mins

VIII. PERSONAL PROTECTIVE EQUIPMENT

For field work to be performed at this site, Level D personal protective equipment (PPE) is required. Level D PPE requirements are defined in Section 5.1.5 of the SSHP (Shaw, 2006). In general, the use of hard hats is required on all USACE work sites, except on MEC-contaminated sites. At this FUDS, hard hats will only be worn if an overhead hazard is identified. If hard hats are worn, they will be securely fastened to the wearers head. Tyvek[®] coveralls and gloves will be worn if poisonous plants, ticks, or other biological hazards are observed in the work area.

Contingency: Evacuate site if higher level of protection is needed.

IX. DECONTAMINATION PROCEDURES

Decontamination procedures are not anticipated as Level D PPE is being used. If decontamination is deemed necessary, procedures defined in Section 7.0 of the SSHP in the Work Plan will be followed (Shaw, 2003). Team members are cautioned not to walk, kneel, or sit on any surface with potential leaks, spills, or contamination.

X. TRAINING

All site personnel and visitors will have completed the minimum training required by EM 385-1-1 (USACE, 2003) and 29 CFR 1910.120(e). The Shaw Field Team Leader will verify that all on-site personnel and visitors have completed the appropriate training prior to admitting the individuals on site. Additionally, the UXO Technician assigned to this field reconnaissance will inform personnel before entering, of any potential site specific hazards and MEC safety procedures.

XI. GENERAL

The number of persons visiting the site will be held to a minimum. The UXO Technician can supervise no more than six non-UXO qualified persons while on MEC sites performing intrusive or nonintrusive work per DDESB TP-18. The Field Team Leader (with concurrence from the Health and Safety Manager) may modify this SSHP Addendum if site conditions warrant. All changes to the SSHP require USACE review and concurrence before new procedures can be applied in the field.

XII. SEVERE WEATHER CONTINGENCY PLAN

Sudden changes in the weather, extreme weather conditions, and natural disasters can create a number of subsequent hazards. Inclement weather may cause poor working conditions including slip, trip, and fall hazards to exist. Natural disasters can create many secondary hazards such as release of hazardous materials to the environment, structure failure, and fires.

Weather conditions will be monitored throughout the day by all field team members. Additionally, field personnel should be aware of/informed of daily weather forecasts. Local weather broadcasts and information from a severe weather alert radio will be monitored by the Field Team Leader, Site Safety and Health Officer, or designee when the likelihood for severe weather exists. The location of Tornado Shelters that may be located in the general area where field work is being performed will be identified. Severe weather may include:

- Tornadoes,
- Thunderstorms (lightning, rain, flash flooding),

- Hail, and
- High wind.

Generally, cellular telephone communication will be used to alert crews to threatening weather. The necessary precautions or response, as directed by the Field Team Leader, to implement the Severe Weather Contingency Plan include:

- Reconnaissance and sampling operations will be suspended when the potential for lightning occurs. Operations may resume 30 minutes after the last observed lightning strike.
- Tornado shelters will be designated prior to the first day of fieldwork.
- For most types of severe weather, personnel should take refuge in vehicles or inside a designated office.
- In the event of a tornado, personnel should take cover in a basement, ditch, culvert, open “igloo,” or interior room of a strong building. Personnel should be aware that ditches and culverts may fill up with water quickly and should only use these as shelters as a last resort.
- The Field Team Leader must decide what operations, if any, are safe to perform based on existing conditions and anticipated conditions.

Additional information will be developed and communicated to personnel before commencing new tasks or activities. It may be necessary to halt certain hazardous operations or stop work altogether to allow the weather situation to pass.

Routinely monitoring weather conditions and reports may help reduce the impact of severe weather and natural disasters. The best protection against most severe weather episodes and natural disasters is to avoid them. This means seeking shelter before the storm hits. If lightning is a threat, stay away from pipes and electrical equipment and watch for damage caused by nearby lightning strikes.

SAFETY BRIEFING CHECKLIST

SITE NAME: Fort Columbia Military Reservation	DATE/TIME: /
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GENERAL INFORMATION

(Check subjects discussed)

- ☐ PURPOSE OF VISIT
- ☐ IDENTIFY KEY SITE PERSONNEL
- ☐ TRAINING AND MEDICAL REQUIREMENTS

SPECIFIC INFORMATION

- ☐ SITE DESCRIPTION/PAST USES
- ☐ RESULTS OF PREVIOUS STUDIES
- ☐ POTENTIAL SITE HAZARDS
- ☐ MEC SAFETY PROCEDURES
- ☐ SITE SOPs
- ☐ SITE CONTROL AND COMMUNICATIONS
- ☐ EMERGENCY RESPONSE
 - ☐ LOCATION OF FIRST AID KIT
 - ☐ EMERGENCY PHONE NUMBERS AND LOCATION
 - ☐ LOCATION AND MAP TO NEAREST MEDICAL FACILITY
 - ☐ PPE AND DECONTAMINATION

Stress the following during the briefing: If hazardous conditions arise, stop work, evacuate the area, and notify the SSHO and Shaw Project Manager immediately.

PLAN ACCEPTANCE FORM
SITE SAFETY AND HEALTH PLAN ADDENDUM
FOR

Site Name: Fort Columbia Military Reservation
Location: Chinook, Washington

I have read and agree to abide by the contents of the Site Safety and Health Plan and this Addendum and I have attended the Safety Briefing for the aforementioned site.

NAME (PRINTED)	OFFICE	SIGNATURE	DATE

Person presenting the safety briefing:

SIGNATURE

DATE